DISH WIRELESS SITE ID: SFSFO00398A
DISH WIRELESS SITE ADDRESS:
724 ARASTRADERO RD
PALO ALTO, CA 94304
INSTALLATION OF TELECOMMUNICATION SITE

CONSTRUCTION DRAWING

IF USING 11"X17" PLOT, DRAWINGS WILL BE HALF SCALE

APPLICABLE CODES

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES.

- CALIFORNIA ADMINISTRATIVE CODE (INCL TITLE 24 & 25)
- 2019 CALIFORNIA BUILDING CODE
- CITY/COUNTY ORDINANCES
- BUILDING OFFICIALS & CODE ADMINISTRATORS (BOCA)
- 2019 MECHANICAL CALIFORNIA CODE
- ANSI/EIA-222-F LIFE SAFETY CODE NFPA-101
- 2019 CALIFORNIA PLUMBING CODE
- 2019 CALIFORNIA ELECTRICAL CODE
- LOCAL BUILDING CODE

GENERAL NOTES

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS REQUIREMENTS ARE NOT REQUIRED IN ACCORDANCE WITH THE 2019 CALIFORNIA BUILDING CODE. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

SITE INFORMATION

PROPERTY OWNER:	SASAKI GO SR TRUSTEE & ET AL & SASAKI KAY K TRUSTEE PO BOX 536 LOS ALTOS, CA 94023
APPLICANT: ADDRESS:	DISH WIRELESS 5701 S SANTA FE DR LITTLETOWN, CO 80120
LATITUDE:	37.401083°
LONGITUDE:	-122.131833°
LAT/LONG TYPE:	NAD-83
GROUND ELEVATION:	±90' AMSL
ZONING JURISDICTION:	CITY OF PALO ALTO
CURRENT ZONING:	RM40 - HIGH DENSITY MULTIPLE FAMILY RESIDENCE DISTRICT
ASSESSOR'S PARCEL NO.:	137-29-017
PROPOSED USE:	UNMANNED TELECOMMUNICATIONS FACILITY
TYPE OF CONSTRUCTION:	TYPE V
OCCUPANCY GROUP:	R-2
EQUIPMENT LEASE AREA (SF):	±164 S.F.

PROJECT TEAM

APPLICANT:
DISH WIRELESS
5701 S SANTA FE DR
LITTLETOWN, CO 80120

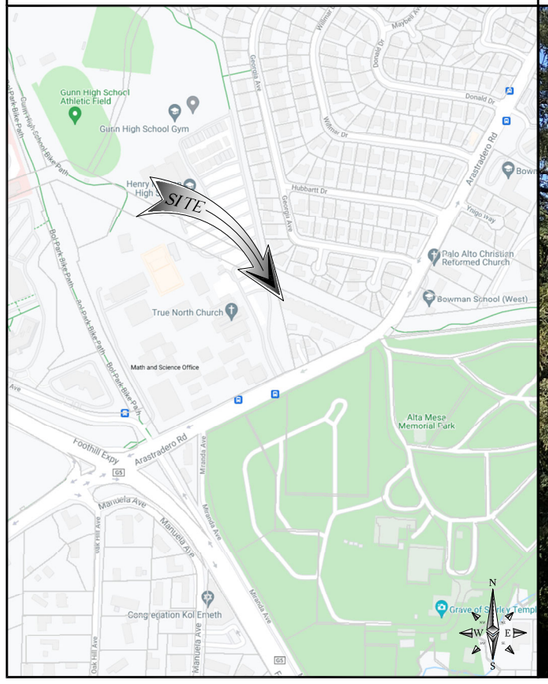
SITE ACQUISITION:
QUALTEK WIRELESS
1200 DEL PASO RD, STE 150
SACRAMENTO, CA 95843
EMAIL: NCA_DISH@QUALTEKWIRELESS.COM

CONSTRUCTION MANAGER:
QUALTEK WIRELESS
1200 DEL PASO RD, STE 150
SACRAMENTO, CA 95843
CONTACT: JOSHUA ROBERSON
PH: (949) 505-4225-6433
EMAIL: JROBERSON@QUALTEKWIRELESS.COM

ENGINEER:
M SQUARED WIRELESS
1387 CALLE AVANZADO
SAN CLEMENTE, CA 92673
CONTACT: MICHAEL MONTELLO
PH: (949) 391-6824

RF ENGINEER:
DISH WIRELESS
5701 S SANTA FE DR
LITTLETOWN, CO 80120
CONTACT: POOJA SHAH

VICINITY MAP



SITE PHOTO

DRIVING DIRECTIONS

DIRECTIONS FROM SAN FRANCISCO INTERNATIONAL AIRPORT:

1. HEAD SOUTH
2. KEEP LEFT, FOLLOW SIGNS FOR US-101 S/SAN JOSE AND MERGE ONTO US-101 S
3. TAKE EXIT 400C TO MERGE ONTO SAN ANTONIO RD
4. MERGE ONTO SAN ANTONIO RD
5. TURN RIGHT ONTO E CHARLESTON RD
6. CONTINUE ONTO ARASTRADERO RD
7. CONTINUE STRAIGHT TO STAY ON ARASTRADERO RD
8. TURN RIGHT
9. DESTINATION WILL BE ON THE RIGHT

PROJECT DESCRIPTION

THIS IS NOT AN ALL INCLUSIVE LIST. CONTRACTOR SHALL UTILIZE SPECIFIED EQUIPMENT PART OR ENGINEER APPROVED EQUIVALENT. CONTRACTOR SHALL VERIFY ALL NEEDED EQUIPMENT TO PROVIDE A FUNCTIONAL SITE.

THE PROJECT GENERALLY CONSISTS OF THE FOLLOWING:

SECTOR SCOPE OF WORK:
- INSTALL (1) NEW ANTENNA MOUNT
- INSTALL (3) NEW PANEL ANTENNAS (1 PER SECTOR)
- INSTALL (3) FUTURE PANEL ANTENNAS (1 PER SECTOR)
- INSTALL (3) NEW DUAL STANDOFF ARM MOUNTS (1 PER SECTOR)
- INSTALL (6) NEW RRUS (2 PER SECTOR)
- INSTALL (6) FUTURE RRUS (2 PER SECTOR)
- INSTALL (1) NEW SURGE SUPPRESSION DEVICE
- INSTALL (1) NEW HYBRID CABLE (±60')
- INSTALL PROPOSED JUMPERS

OUTDOOR SCOPE OF WORK:
- INSTALL (1) NEW CABINET
- INSTALL (1) NEW NEMA 3 TELCO-FIBER BOX
- INSTALL (1) NEW GPS ANTENNA

REFERENCE RFDS REVISION 1, DATED 02/08/2022

DRAWING INDEX

APPROVALS

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS & AUTHORIZE THE SUBCONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT & MAY IMPOSE CHANGES OR MODIFICATIONS.

DISH WIRELESS RF ENGINEER: _____ DATE: _____

DISH WIRELESS OPERATIONS: _____ DATE: _____

SITE ACQUISITION: _____ DATE: _____

CONSTRUCTION MANAGER: _____ DATE: _____

PROPERTY OWNER: _____ DATE: _____

ZONING: _____ DATE: _____

PROJECT MANAGER: _____ DATE: _____

DO NOT SCALE DRAWINGS

SUBCONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS & FIELD CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

dish wireless
5701 S SANTA FE DR
LITTLETON, CO 80120

QUALTEK WIRELESS
1200 DEL PASO RD, STE 150
SACRAMENTO, CA 95843

M SQUARED WIRELESS
1387 CALLE AVANZADO
SAN CLEMENTE CA 92673 (949) 391-6824

DRAWN BY: CP

CHECKED BY: MM

REV	DATE	DESCRIPTION
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1	09/23/2022	100% CD'S FOR SUBMITTAL
0	03/24/2022	100% CD'S FOR SUBMITTAL
B	02/18/2022	100% CD'S FOR REVIEW
A	02/09/2022	90% CD'S FOR REVIEW

REGISTERED PROFESSIONAL ENGINEER
LOYALL A. WHARTON
C50547
CIVIL
STATE OF CALIFORNIA

DATE SIGNED: 10/03/2022

Loyall A. Wharton, P.E.
Professional Engineer License: #C50547
Expiration Date: 06-30-2023

SFSFO00398A
724 ARASTRADERO RD
PALO ALTO, CA 94304
ROOFTOP

SHEET TITLE

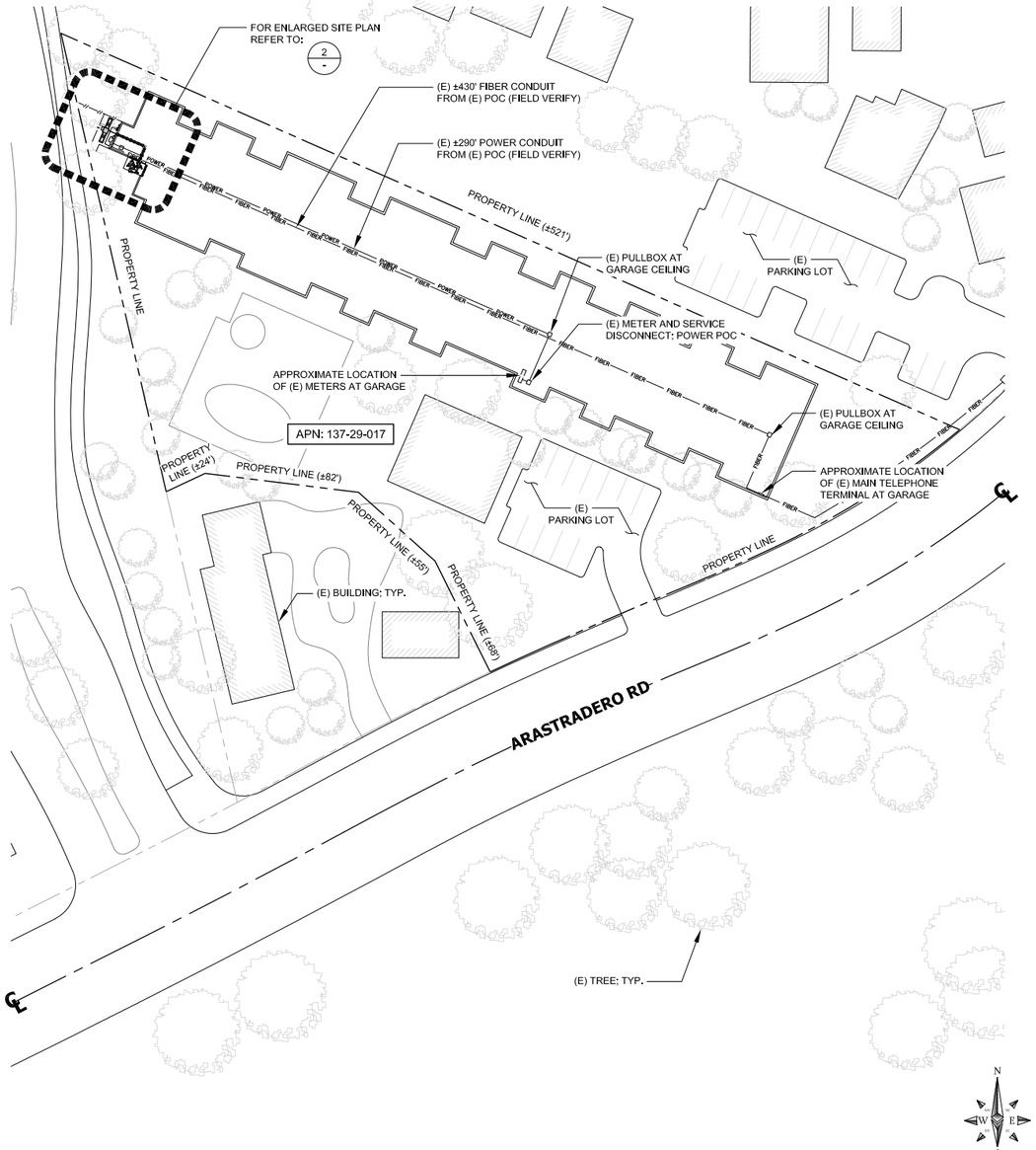
TITLE SHEET

SHEET NUMBER

T-1

NOTES:

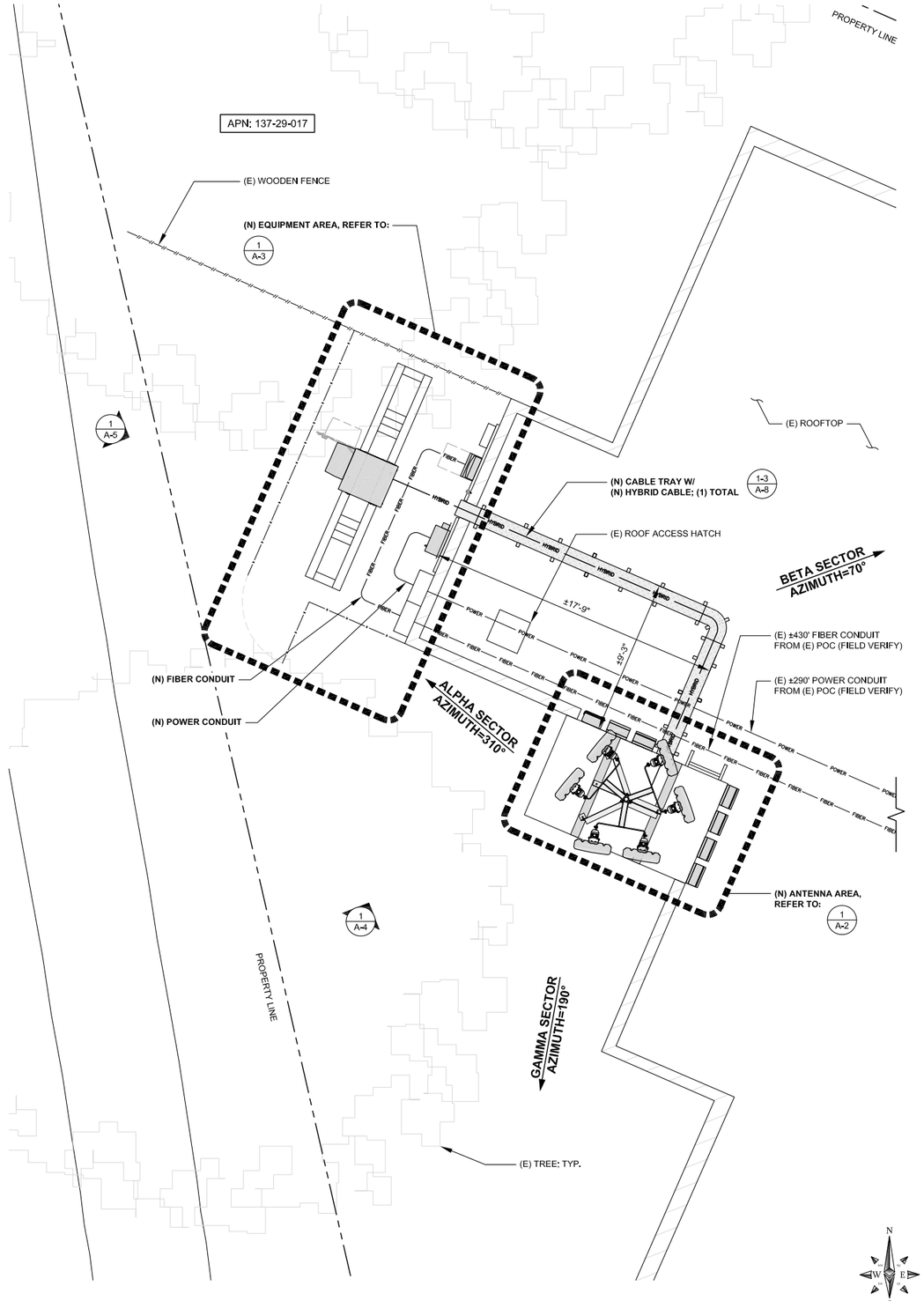
1. THE WIRELESS COMMUNICATION FACILITY COMPLIES WITH FEDERAL STANDARDS FOR RADIO FREQUENCY IN ACCORDANCE WITH THE TELECOMMUNICATION ACT OF 1996 AND SUBSEQUENT AMENDMENTS AND ANY OTHER REQUIREMENTS IMPOSED BY STATE OR FEDERAL REGULATORY AGENCIES.
2. NO EXISTING PARKING STALLS ARE BEING ADDED OR REMOVED AS PART OF THE NEW INSTALLATION.
3. THESE DRAWINGS WERE PRODUCED WITHOUT THE BENEFIT OF A CURRENT LAND SURVEY. ALL PROPERTY LINES, EASEMENTS, SETBACKS, AND EXISTING CONDITIONS ARE APPROXIMATE AND SHALL BE VERIFIED PRIOR TO START OF CONSTRUCTION.
4. NO GRADING WORK IS INCLUDED IN THIS SCOPE OF WORK ON THIS PAGE.
5. PROPOSED WORK IS COMPLIANT WITH 6409(A) ELIGIBILITY FACILITIES REQUEST CRITERIA



OVERALL SITE PLAN

24"x36" SCALE: 1" = 40'-0"
11"x17" SCALE: 1" = 80'-0"
0" 20' 40' 80'

1



ENLARGED SITE PLAN

24"x36" SCALE: 1/4" = 1'-0"
11"x17" SCALE: 1/8" = 1'-0"
0" 2' 4' 8'

2

dish wireless.
5701 S SANTA FE DR
LITTLETON, CO 80120

QUALTEK WIRELESS
1200 DEL PASO RD, STE 150
SACRAMENTO, CA 95843

M SQUARED WIRELESS
1387 CALLE AVANZADO
SAN CLEMENTE CA 92673 (949) 391-6824

DRAWN BY: CP
CHECKED BY: MM

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REGISTERED PROFESSIONAL ENGINEER
LOYALL A. WHARTON
C50547
CIVIL
STATE OF CALIFORNIA

DATE SIGNED: 10/03/2022

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Expiration Date: 06-30-2023

SFSFO00398A
724 ARASTRADERO RD
PALO ALTO, CA 94304
ROOFTOP

SHEET TITLE
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER
A-1

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	CELLMAX CX12044x	5G	72.4" x 26.7"	310°	42'-0"	(1) HIGH-CAPACITY HYBRID CABLE (±60' LONG)
	A2	FUTURE	CELLMAX CX12044x	TBD	72.4" x 26.7"	310°	42'-0"	
BETA	B1	PROPOSED	CELLMAX CX12044x	5G	72.4" x 26.7"	70°	42'-0"	
	B2	FUTURE	CELLMAX CX12044x	TBD	72.4" x 26.7"	70°	42'-0"	
GAMMA	C1	PROPOSED	CELLMAX CX12044x	5G	72.4" x 26.7"	190°	42'-0"	
	C2	FUTURE	CELLMAX CX12044x	TBD	72.4" x 26.7"	190°	42'-0"	

NOTES TO CONTRACTOR:

1. CONTRACTOR IS TO REFER TO DISH WIRELESS'S MOST CURRENT RADIO FREQUENCY DATA SHEET (RFDS) PRIOR TO CONSTRUCTION.
2. CABLE LENGTHS WERE DETERMINED BASED ON VISUAL INSPECTION DURING SITE-WALK. CONTRACTOR TO VERIFY ACTUAL LENGTH DURING PRE-CONSTRUCTION WALK.

NOTES:

1. ANTENNA AZIMUTHS ARE ESTIMATED AND ARE TO BE VERIFIED BY RF.
2. ANTENNA BY OTHERS NOT SHOWN FOR CLARITY.
3. PRIOR TO ORDERING ANTENNAS VERIFY CORRECT MODEL NUMBER WITH LATEST RFDS AND NOTIFY ENGINEER OF RECORD IMMEDIATELY IF DISCREPANCY IS FOUND.

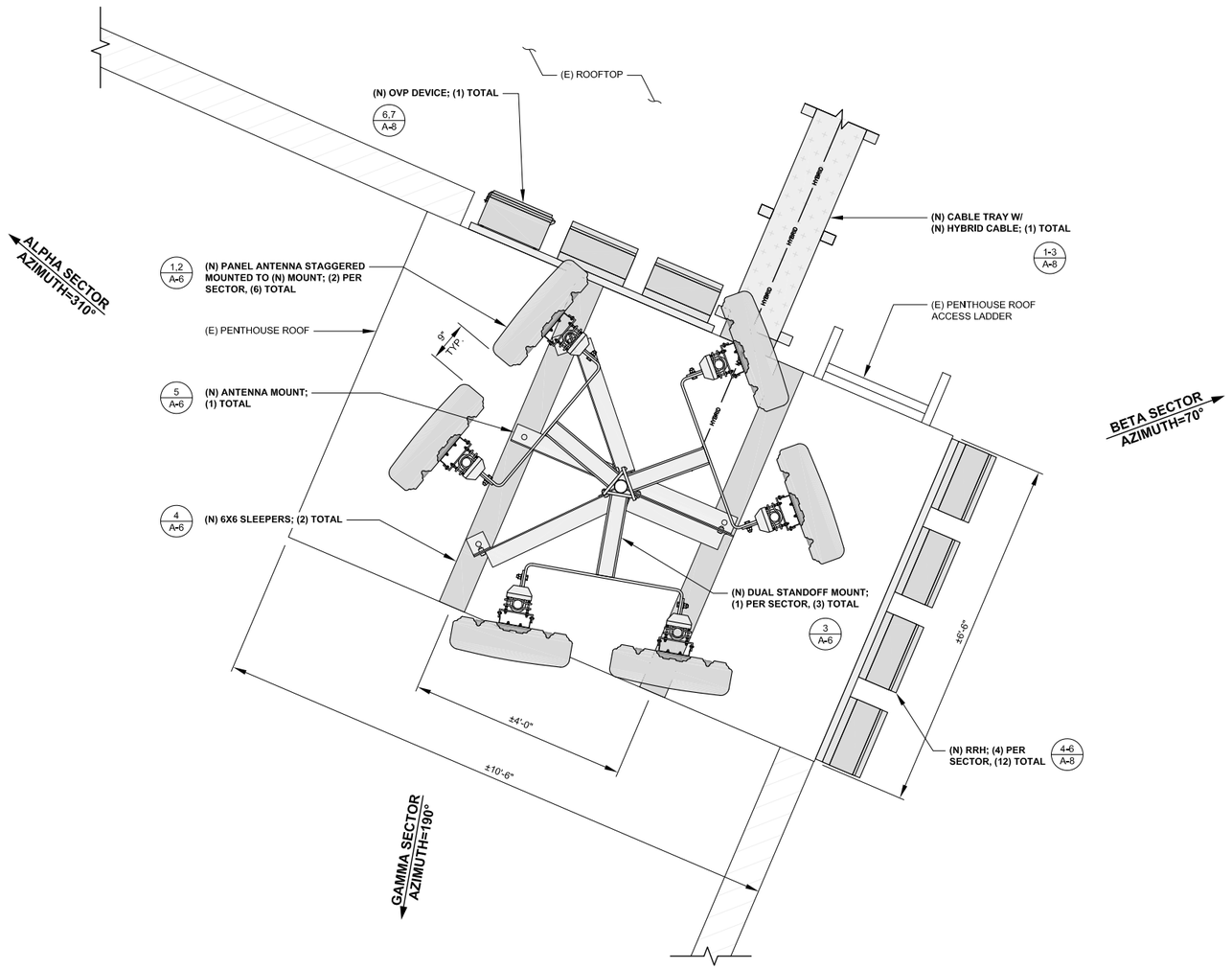
SECTOR	POSITION	RRH	
		MANUFACTURER – MODEL NUMBER	TECHNOLOGY
ALPHA	A1/A2	FUJITSU TA08025-B604	N71
	A1/A2	FUJITSU TA08025-B605	N70/N66
BETA	B1/B2	FUJITSU TA08025-B604	N71
	B1/B2	FUJITSU TA08025-B605	N70/N66
GAMMA	C1/C2	FUJITSU TA08025-B604	N71
	C1/C2	FUJITSU TA08025-B605	N70/N66

NOTES

1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS.
2. ANTENNA AND RRH MODELS MAY CHANGE DUE TO EQUIPMENT AVAILABILITY. ALL EQUIPMENT CHANGES MUST BE APPROVED AND REMAIN IN COMPLIANCE WITH THE PROPOSED DESIGN AND STRUCTURAL ANALYSES.

1. M SQUARED WIRELESS ACCEPTS NO LIABILITY FOR THE STRUCTURAL CAPACITY OF THE STRUCTURE, MOUNTS, ANTENNAS, CABLES OR ANY OTHER APPURTENANCE ON THE TOWER. THE CONTRACTOR AND SUBCONTRACTOR SHALL COORDINATE WITH AND COMPLY WITH THE PROVISIONS OF THE STRUCTURAL ANALYSIS PREPARED FOR THIS SITE AND PROJECT PRIOR TO THE INSTALLATION OF ANTENNAS AND CABLE ON THE TSTRUCTURE. IMMEDIATELY REPORT ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DRAWINGS AND THE STRUCTURAL ANALYSIS TO DISH WIRELESS.
2. REFER TO THE STRUCTURAL ANALYSIS AND/OR STRUCTURAL LETTER FOR THE APPROVAL OF ALL MODIFICATIONS TO AND ADDING EQUIPMENT OF NEW TOWER APPURTENANCES.
3. REFER TO ADDITIONAL DRAWINGS SPECIFIC TO STRUCTURE REINFORCEMENT FOR THIS SITE SHOULD THERE BE A REQUIREMENT FOR ANY STRUCTURE REINFORCEMENT.
4. REFER TO STRUCTURAL ANALYSIS FOR COAXIAL AND OTHER CABLE SUPPORT AND CONFIGURATION DETAIL.
5. REFER TO STRUCTURAL ANALYSIS FOR ALL CARRIERS APPURTENANCES AS THEY MAY NOT BE SHOWN IN ELEVATION DETAIL.
6. PRIOR TO ORDERING ANTENNAS VERIFY CORRECT MODEL NUMBER WITH LATEST RFDS AND NOTIFY ENGINEER OF RECORD IMMEDIATELY IF DISCREPANCY IS FOUND.

ANTENNA & EQUIPMENT SCHEDULE



PROPOSED ANTENNA LAYOUT

24"x36" SCALE: 3/4" = 1'-0"
11"x17" SCALE: 3/8" = 1'-0"
0" 6" 1' 2'

1

dish wireless.
5701 S SANTA FE DR
LITTLETON, CO 80120

QUALTEK WIRELESS
1200 DEL PASO RD, STE 150
SACRAMENTO, CA 95843

M SQUARED WIRELESS
1387 CALLE AVANZADO
SAN CLEMENTE CA 92673 (949) 391-6824

DRAWN BY: CP

CHECKED BY: MM

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A	02/09/2022	90% CD'S FOR REVIEW

REGISTERED PROFESSIONAL ENGINEER
LOYALL A. WHARTON
C50547
CIVIL
STATE OF CALIFORNIA

DATE SIGNED: 10/03/2022

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Professional Engineer License: #C50547
Expiration Date: 06-30-2023

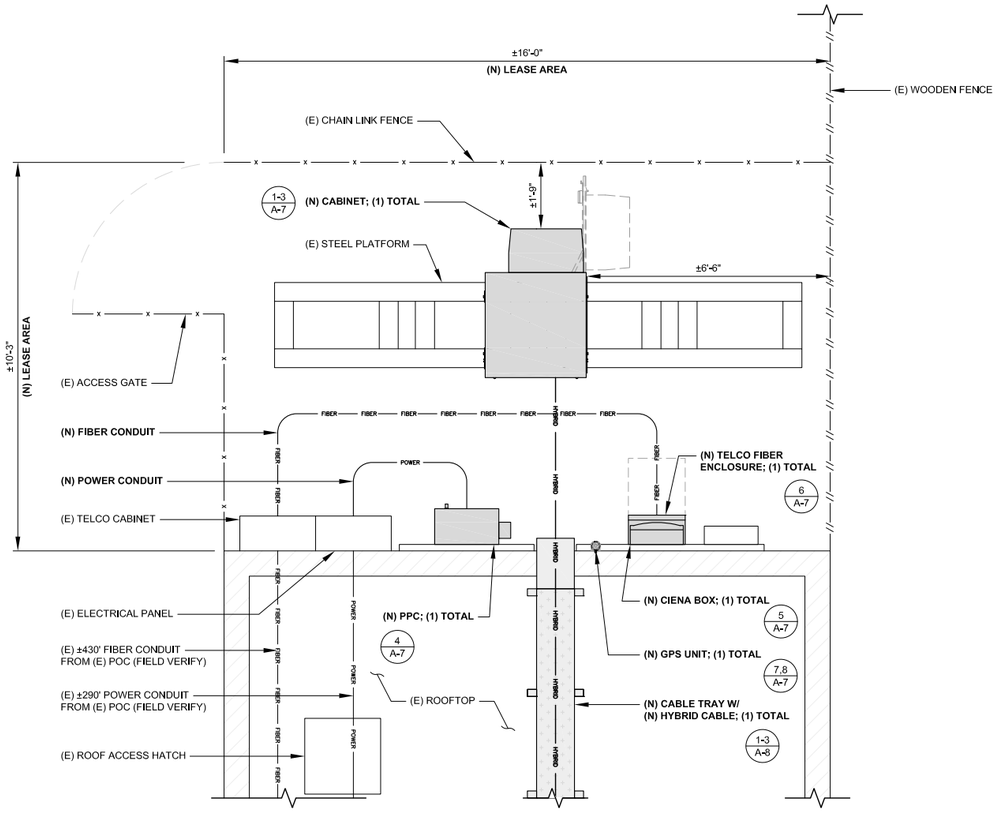
SFSFO00398A
724 ARASTRADERO RD
PALO ALTO, CA 94304
ROOFTOP

SHEET TITLE
ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER
A-2

NOTES:

1. ROOFTOP NOT SHOWN FOR CLARITY.
2. ANTENNAS NOT SHOWN FOR CLARITY.



PROPOSED EQUIPMENT LAYOUT

24"x36" SCALE: 1/2" = 1'-0"
11"x17" SCALE: 1/4" = 1'-0"

0" 1' 2' 4'

1

dish wireless.
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SFSFO00398A
724 ARASTRADERO RD
PALO ALTO, CA 94304
ROOFTOP

SHEET TITLE

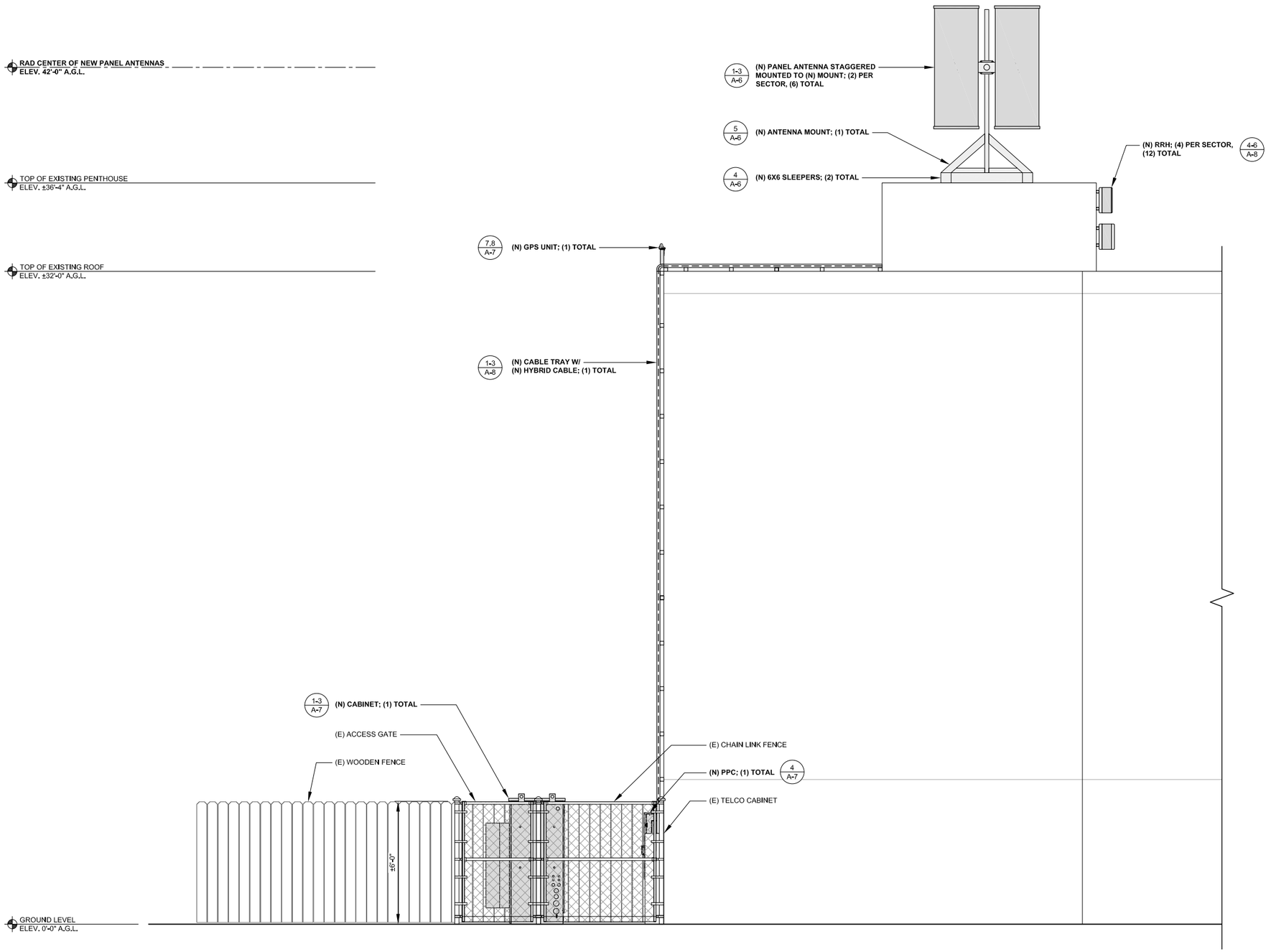
EQUIPMENT LAYOUT

SHEET NUMBER

A-3

NOTE:

1. PROPOSED EQUIPMENT TO BE PAINTED TO MATCH EXISTING STRUCTURE.



PROPOSED SOUTHWEST ELEVATION

24"x36" SCALE: 3/8" = 1'-0"
11"x17" SCALE: 3/16" = 1'-0"
0" 1' 2' 4'

1

dish wireless.
5701 S SANTA FE DR
LITTLETON, CO 80120

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1200 DEL PASO RD, STE 150
SACRAMENTO, CA 95843

M SQUARED WIRELESS
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DRAWN BY:	CP
CHECKED BY:	MM

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C50547
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STATE OF CALIFORNIA

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SFSFO00398A
724 ARASTRADERO RD
PALO ALTO, CA 94304
ROOFTOP

SHEET TITLE

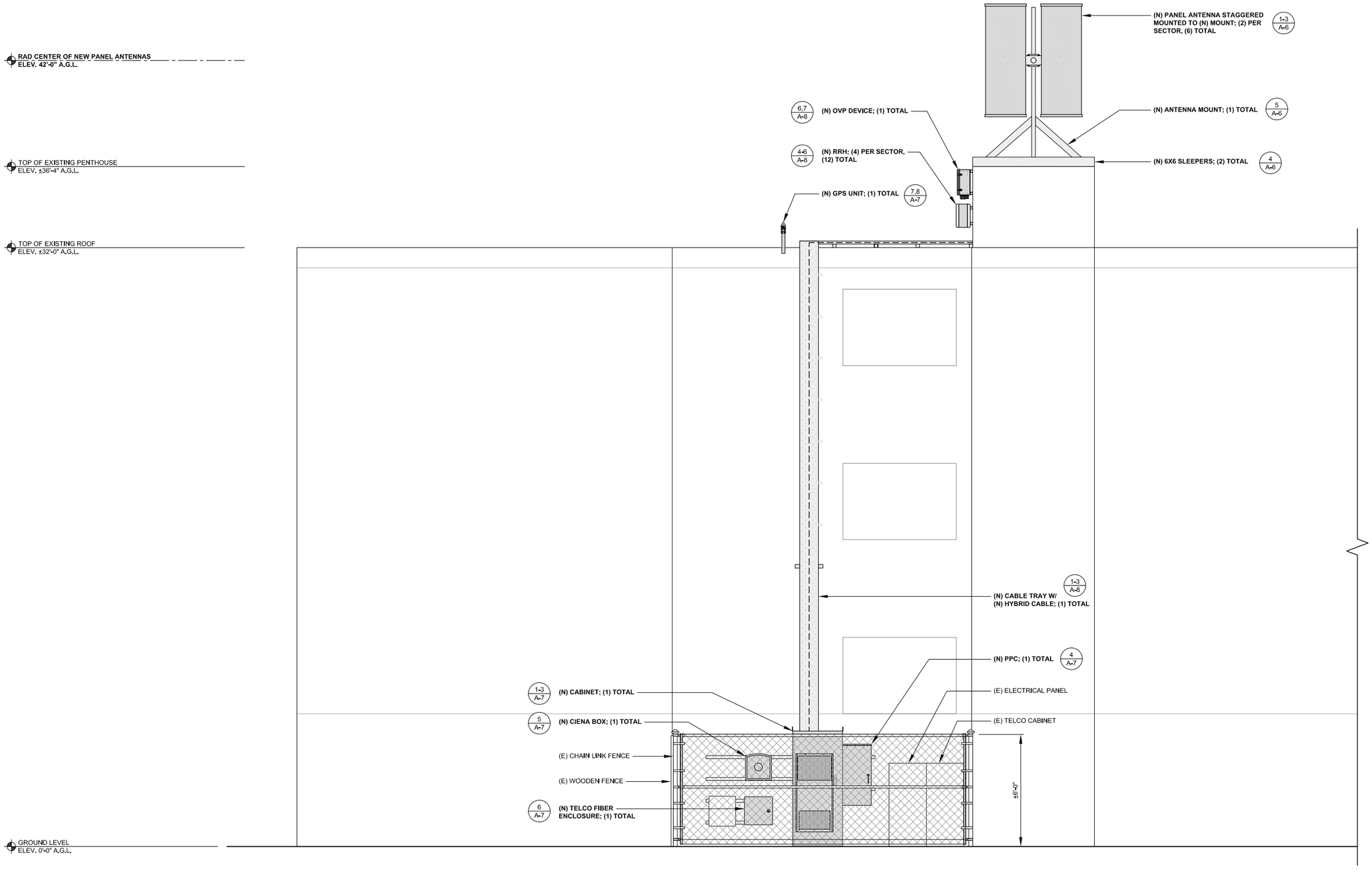
SOUTHWEST ELEVATIONS

SHEET NUMBER

A-4

NOTE:

1. PROPOSED EQUIPMENT TO BE PAINTED TO MATCH EXISTING STRUCTURE.



PROPOSED NORTHWEST ELEVATION

24"x36" SCALE: 3/8" = 1'-0"
11"x17" SCALE: 3/16" = 1'-0"
0" 1' 2' 4'

1

dish wireless.
5701 S SANTA FE DR
LITTLETON, CO 80120

QUALTEK WIRELESS
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REGISTERED PROFESSIONAL ENGINEER
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STATE OF CALIFORNIA

DATE SIGNED: 10/03/2022

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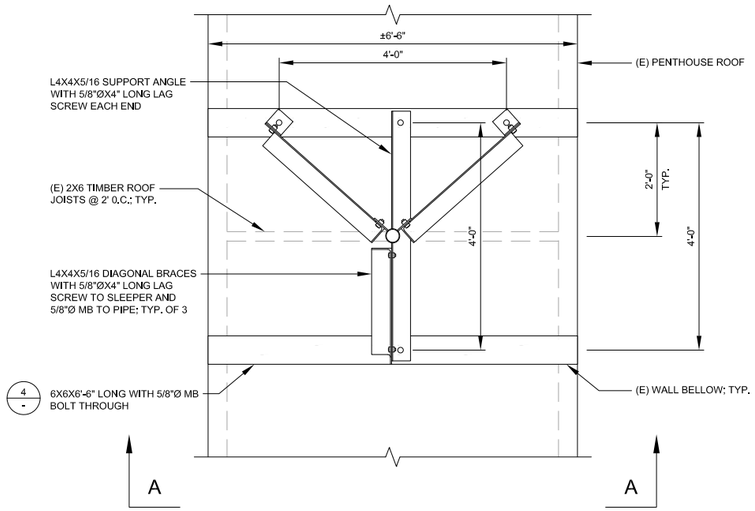
SFSFO00398A
724 ARASTRADERO RD
PALO ALTO, CA 94304
ROOFTOP

SHEET TITLE

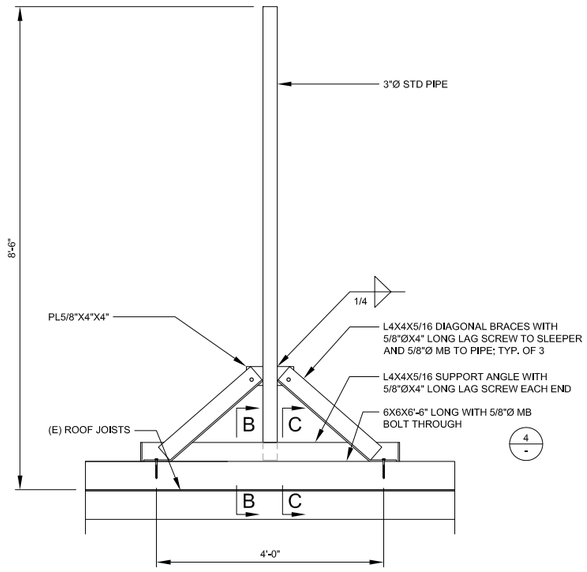
NORTHWEST ELEVATIONS

SHEET NUMBER

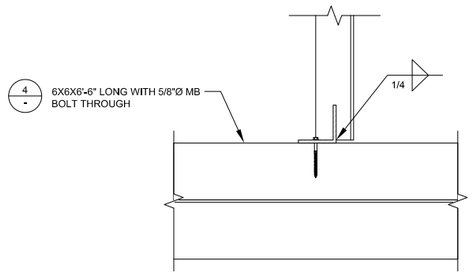
A-5



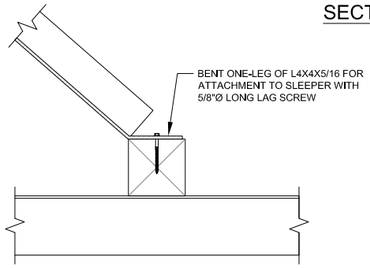
PLAN VIEW



SECTION A-A



SECTION B-B

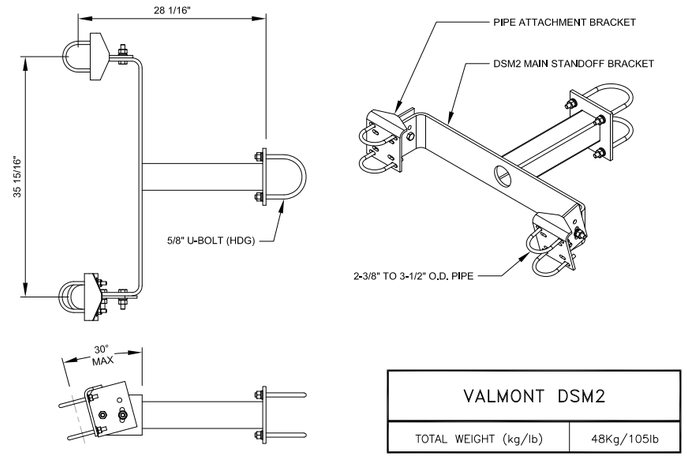


SECTION C-C

ROOFTOP ANTENNA MOUNTING

24"x36" SCALE: NTS
11"x17" SCALE: NTS

5



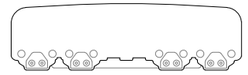
VALMONT DSM2	
TOTAL WEIGHT (kg/lb)	48Kg/105lb

DUAL STANDOFF ARM

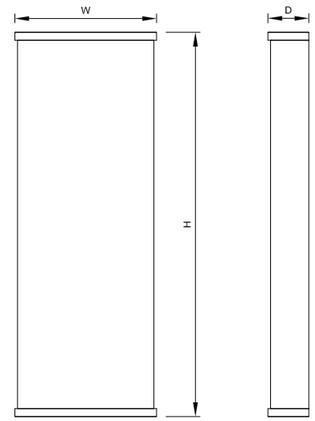
24"x36" SCALE: NTS
11"x17" SCALE: NTS

3

CELLMAX CX12044X	
DIMENSIONS (HxWxD)(mm/in)	1840x680x196/ 72.4"x26.7"x7.7"
TOTAL WEIGHT (kg/lb)	48Kg/105lb
RF CONNECTOR INTERFACE	4.3-10 FEMALE



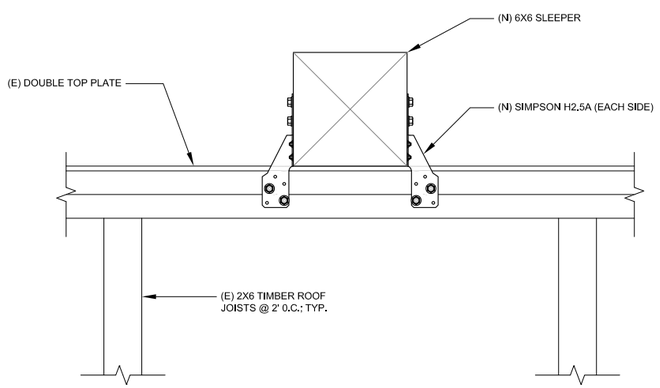
BOTTOM



FRONT SIDE

NOT USED

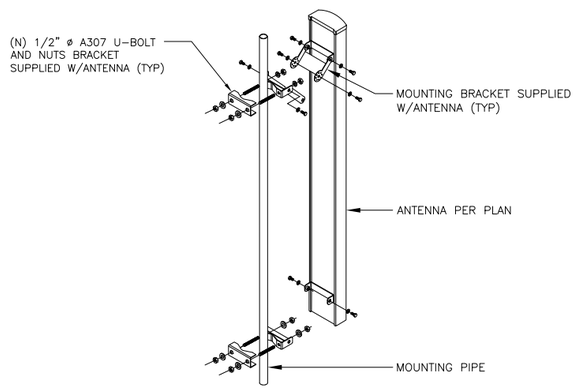
6



SLEEPER TO WALL CONNECTION

24"x36" SCALE: NTS
11"x17" SCALE: NTS

4



ANTENNA MOUNTING

24"x36" SCALE: NTS
11"x17" SCALE: NTS

1

dish wireless.
5701 S SANTA FE DR
LITTLETON, CO 80120

QUALTEK WIRELESS
1200 DEL PASO RD, STE 150
SACRAMENTO, CA 95843

M SQUARED WIRELESS
1387 CALLE AVANZADO
SAN CLEMENTE CA 92673 (949) 391-6824

DRAWN BY:	CP
CHECKED BY:	MM

REV	DATE	DESCRIPTION
2	10/03/2022	100% CD'S FOR SUBMITTAL
1	09/23/2022	100% CD'S FOR SUBMITTAL
0	03/24/2022	100% CD'S FOR SUBMITTAL
B	02/18/2022	100% CD'S FOR REVIEW
A	02/09/2022	90% CD'S FOR REVIEW

DATE SIGNED: 10/03/2022

Loyall A. Wharton, P.E.
Professional Engineer License: #C50547
Expiration Date: 06-30-2023

SFSFO00398A
724 ARASTRADERO RD
PALO ALTO, CA 94304
ROOFTOP

SHEET TITLE

EQUIPMENT DETAILS

SHEET NUMBER

A-6

NOT USED

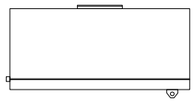
9

FIBER TELCO ENCLOSURE

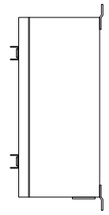
24"x36" SCALE: NTS
11"x17" SCALE: NTS

6

CHARLES CFIT–PF2020DSH1 FIBER TELCO ENCLOSURE	
ENCLOSURE DIMS (HxWxD)	20"x20"x9"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4



PLAN



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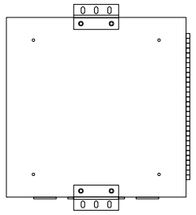
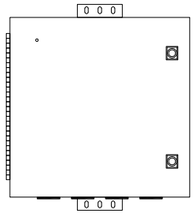


BACK



FRONT

6" CABINET PLINTH

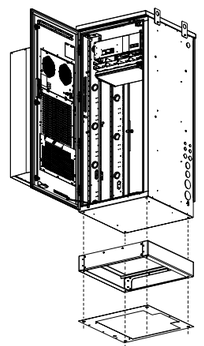
24"x36" SCALE: NTS
11"x17" SCALE: NTS

3

CHARLES 6" PLINTH FOR PM639155N4 SERIES	
MATERIAL	STEEL
TOTAL WEIGHT AS SHIPPED	71 LBS

KIT INSTALLATION:
1. LOCATE THE GASKET THAT SHIPS WITH THE CUBE.
2. FOLLOW THE INSTALLATION INSTRUCTIONS THAT SHIP WITH THE CUBE FOR PREPARING THE CONCRETE PAD.
3. PLACE THE GASKET ON THE CONCRETE PAD. PLACE THE PLINTH ON THE GASKET. ENSURE THAT ALL MOUNTING HOLES ARE PROPERLY ALIGNED.
4. SECURE THE PLINTH TO THE PAD USING FOUR CUSTOMER SUPPLIED, CORROSION RESISTANT, 1/2"–13 HEX HEAD BOLTS WITH ANCHORS. SEE THE INSTRUCTIONS THAT SHIP WITH THE CUBE.
5. LOWER THE CUBE ONTO THE PLINTH, ENSURING THAT THE MOUNTING HOLES ON THE CUBE ARE ALIGNED WITH THE HOLES ON TOP OF THE PLINTH.
6. SECURE THE CUBE TO THE PLINTH USING HARDWARE THAT SHIPS WITH THE PLINTH.

ISO VIEW

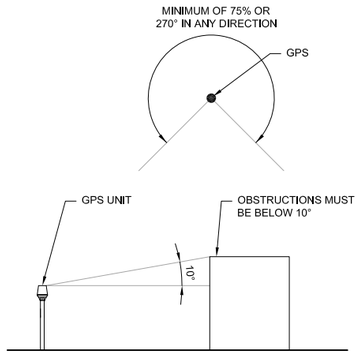


GASKET (80–005300–A, INCLUDED W/ CUBE)

GPS MINIMUM SKY VIEW REQUIREMENTS

24"x36" SCALE: NTS
11"x17" SCALE: NTS

8

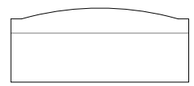


CIENA BOX

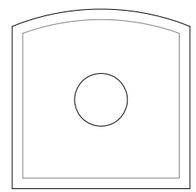
24"x36" SCALE: NTS
11"x17" SCALE: NTS

5

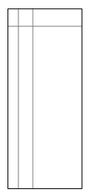
CIENA 3931 SERVICE DELIVERY SWITCH	
DIMENSIONS (HxWxD)	17.0"x16.8"x7.0"
WEIGHT	28.6 lbs
POWER INPUT	60W MAX



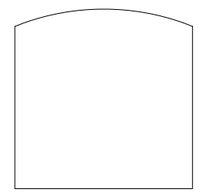
PLAN



FRONT



SIDE



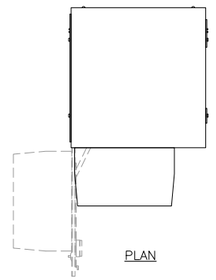
BACK

EQUIPMENT CABINET

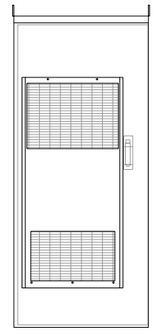
24"x36" SCALE: NTS
11"x17" SCALE: NTS

2

EQUIPMENT CABINET CHARLES CUBE PM639155N4	
ENCLOSURE DIM (HxWxD)	74.1"x32.0"x32.0"
TOTAL WEIGHT W/ NO BATTERIES	559.14 LBS
TOTAL WEIGHT W/ 4 BATTERIES	1067.14 LBS



PLAN



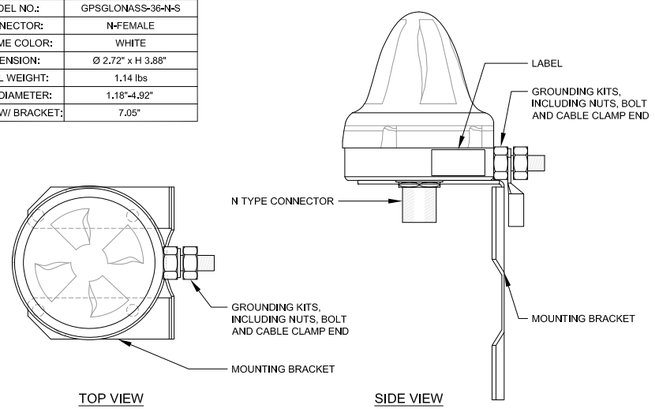
FRONT

GPS ANTENNA

24"x36" SCALE: NTS
11"x17" SCALE: NTS

7

MANUFACTURER:	ROSENBERG
MODEL NO.:	GPSGLONASS-36-N-S
CONNECTOR:	N-FEMALE
RADOME COLOR:	WHITE
DIMENSION:	Ø 2.72" x H 3.88"
TOTAL WEIGHT:	1.14 lbs
POLE DIAMETER:	1.18"-4.92"
HEIGHT W/ BRACKET:	7.05"



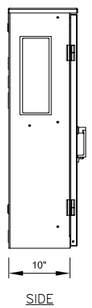
TOP VIEW SIDE VIEW

RAYCAP PPC RDIAC-6512-P-240-MTS

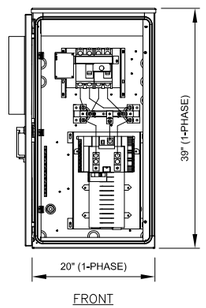
24"x36" SCALE: NTS
11"x17" SCALE: NTS

4

RAYCAP RDIAC–6152–P–240–MTS AC POWER PROTECTION CABINET	
TOTAL WEIGHT	124 LBS
DIMENSIONS	40" X 20" X 10"



SIDE



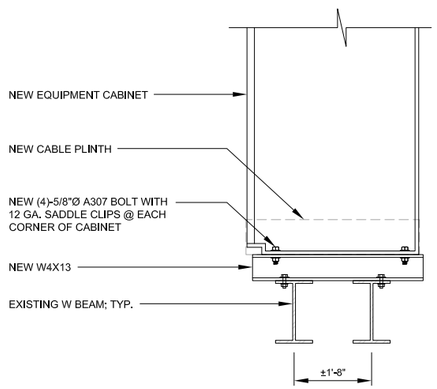
FRONT

CABINET MOUNTING DETAIL

24"x36" SCALE: NTS
11"x17" SCALE: NTS

1

COORDINATE ANCHOR BOLT PLACEMENT WITH MANUFACTURE RECOMMENDATION



dish wireless.
5701 S SANTA FE DR
LITTLETON, CO 80120

QUALTEK WIRELESS
1200 DEL PASO RD, STE 150
SACRAMENTO, CA 95843

M SQUARED WIRELESS
1387 CALLE AVANZADO
SAN CLEMENTE CA 92673 (949) 391-6824

DRAWN BY:	CP
CHECKED BY:	MM

REV	DATE	DESCRIPTION
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0	03/24/2022	100% CD'S FOR SUBMITTAL
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REGISTERED PROFESSIONAL ENGINEER
LOYALL A. WHARTON
C50547
CIVIL
STATE OF CALIFORNIA

DATE SIGNED: 10/03/2022

Loyall A. Wharton, P.E.
Professional Engineer License: #C50547
Expiration Date: 06-30-2023

SFSFO00398A
724 ARASTRADERO RD
PALO ALTO, CA 94304
ROOFTOP

SHEET TITLE

EQUIPMENT DETAILS

SHEET NUMBER

A-7

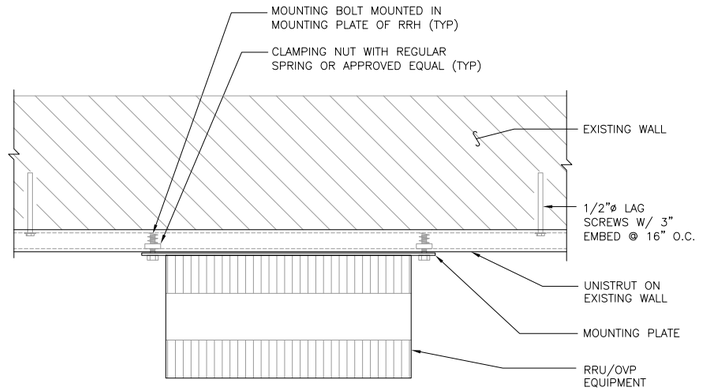
NOT USED

9

RRH/OVP WALL MOUNT

24"x36" SCALE: NTS
11"x17" SCALE: NTS

6

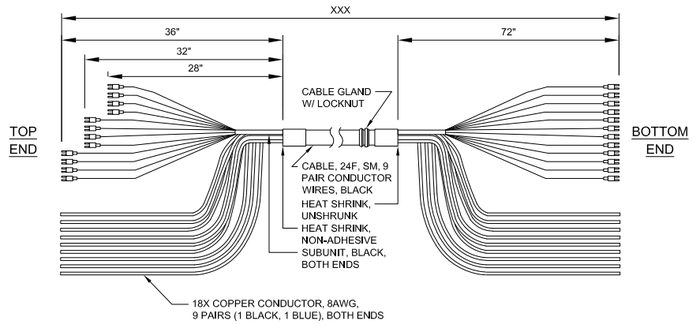


HYBRID TRUNK (0' TO 120')

24"x36" SCALE: NTS
11"x17" SCALE: NTS

3

MANUFACTURER:	CUI
MODEL NO.:	12 PAIR HYBRID ASSEMBLY 8AWG



NOT USED

8

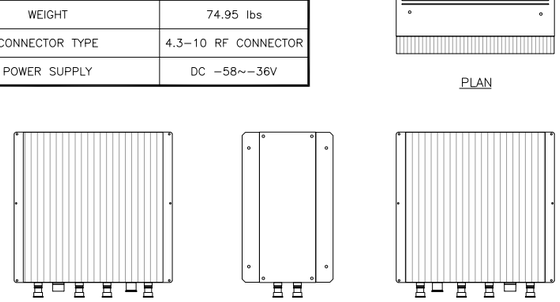
FUJITSU TA08025-B605

24"x36" SCALE: NTS
11"x17" SCALE: NTS

5

FUJITSU TRIPLE BAND TA08025-B605	
DIMENSIONS (HxWxD)	14.9"x15.7"x9
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V

PLAN



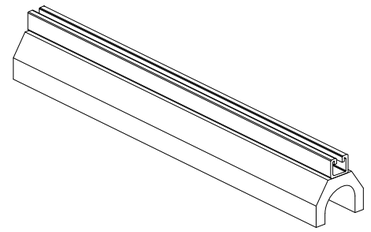
BACK SIDE FRONT

DURA-BLOK

24"x36" SCALE: NTS
11"x17" SCALE: NTS

2

MANUFACTURER:	EATON
MODEL NO.:	DURA-BLOK

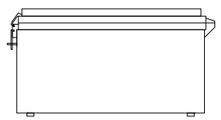


SURGE PROTECTION DEVICE

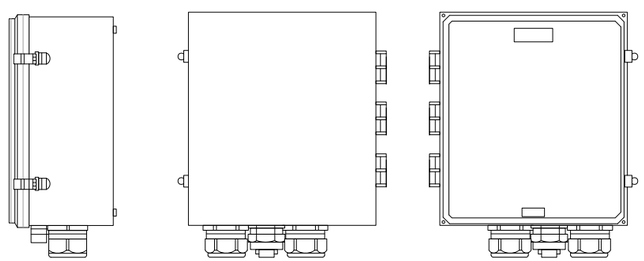
24"x36" SCALE: NTS
11"x17" SCALE: NTS

7

RAYCAP RDIDC-9181-PF-48 SURGE PROTECTION DEVICE	
DIMENSIONS (HxWxD)	16.58" x 14.58" x 8.46"
WEIGHT	21.85 LBS



PLAN



SIDE BACK FRONT

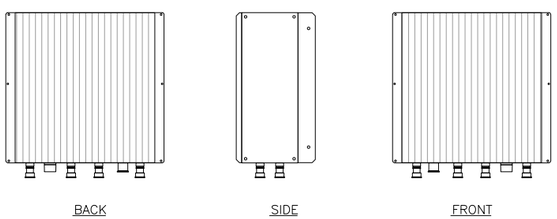
FUJITSU TA08025-B604

24"x36" SCALE: NTS
11"x17" SCALE: NTS

4

FUJITSU DUAL BAND TA08025-B604	
DIMENSIONS (HxWxD)	14.9"X15.7"X7.8"
WEIGHT	63.9 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V

PLAN



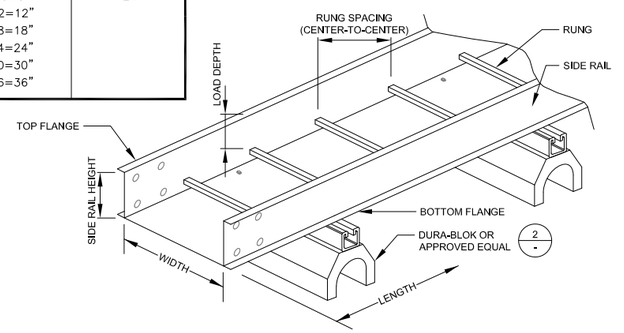
BACK SIDE FRONT

ROOFTOP CABLE TRAY

24"x36" SCALE: NTS
11"x17" SCALE: NTS

1

COPELADDER LT-06-4D	
WIDTH	RUN LENGTH
-06=6" -09=9" -12=12" -18=18" -24=24" -30=30" -36=36"	12' 24'



dish wireless.
5701 S SANTA FE DR
LITTLETON, CO 80120

QUALTEK WIRELESS
1200 DEL PASO RD, STE 150
SACRAMENTO, CA 95843

M SQUARED WIRELESS
1387 CALLE AVANZADO
SAN CLEMENTE CA 92673 (949) 391-6824

DRAWN BY: CP
CHECKED BY: MM

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C50547
CIVIL
STATE OF CALIFORNIA

DATE SIGNED: 10/03/2022

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SFSFO00398A
724 ARASTRADERO RD
PALO ALTO, CA 94304
ROOFTOP

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-8

NOTES:

1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.

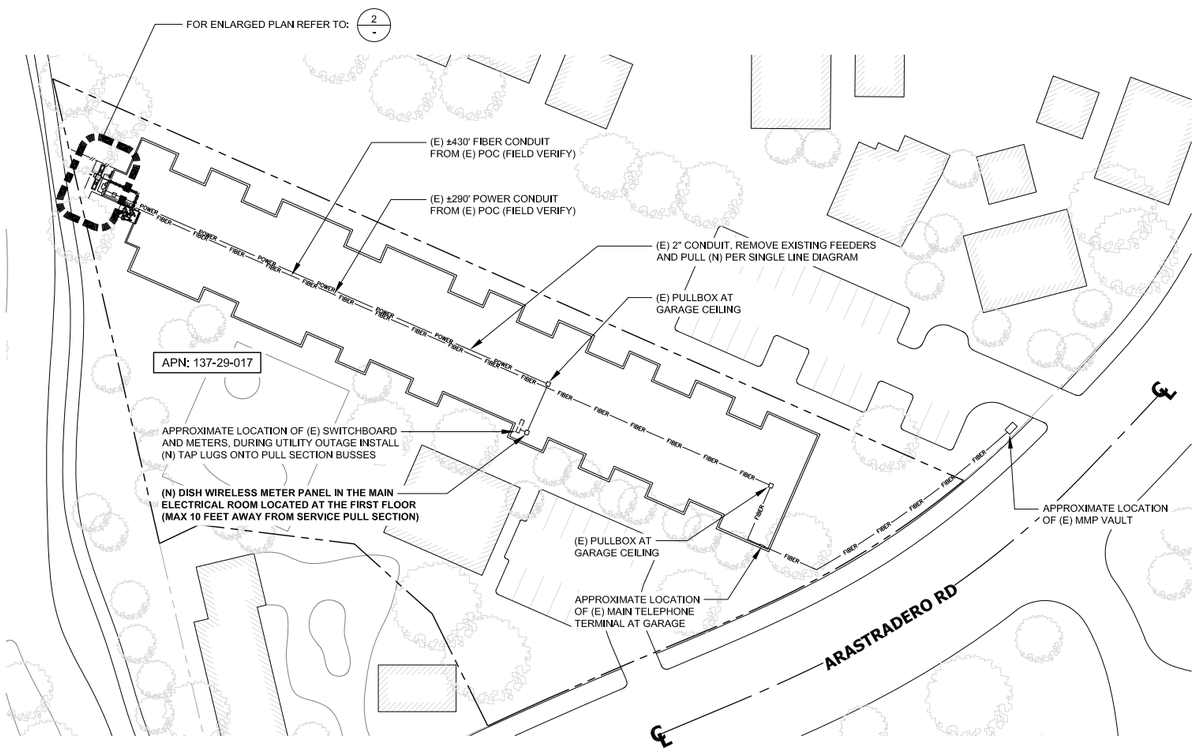
DC POWER WIRING SHALL BE COLOR CODED AT EACH END FOR IDENTIFYING +24V AND -48 CONDUCTORS. RED MARKINGS SHALL IDENTIFY +24V AND BLUE MARKINGS SHALL IDENTIFY -48V.

1. CONTRACTOR SHALL INSPECT THE EXISTING CONDITIONS PRIOR TO SUBMITTING A BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS TO THE CONSTRUCTOR'S FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION, NOT AFTER THE CONTRACT HAS BEEN AWARDED.
2. ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH CURRENT NATIONAL ELECTRICAL CODES AND ALL STATE AND LOCAL CODES, LAWS, AND ORDINANCES. PROVIDE ALL COMPONENTS AND WIRING SIZED AS REQUIRED TO MEET NEC STANDARDS.
3. LOCATION OF EQUIPMENT, CONDUIT AND DEVICES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND SHALL BE COORDINATED WITH FIELD CONDITIONS PRIOR TO CONSTRUCTION.
4. CONDUIT ROUGH-IN SHALL BE COORDINATED WITH THE MECHANICAL EQUIPMENT TO AVOID LOCATION CONFLICTS. VERIFY WITH THE MECHANICAL EQUIPMENT CONTRACTOR AND COMPLY AS REQUIRED.
5. CONTRACTOR SHALL PROVIDE ALL BREAKERS, CONDUITS AND CIRCUITS AS REQUIRED FOR A COMPLETE SYSTEM.
6. CONTRACTOR SHALL PROVIDE PULL BOXES AND JUNCTION BOXES AS REQUIRED BY THE NEC ARTICLE 314.
7. CONTRACTOR SHALL PROVIDE ALL STRAIN RELIEF AND CABLE ASSEMBLES. INSTALLATION SHALL BE IN ACCORDANCE WIT MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
8. ALL DISCONNECTS AND CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED PHENOLIC NAMEPLATES INDICATING EQUIPMENT CONTROLLED, BRANCH CIRCUITS INSTALLED ON, AND PANEL FIELD LOCATIONS FED FROM.
9. INSTALL AND EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS PER THE SPECIFICATIONS AND NEC 250. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BONDED AT ALL JUNCTION BOXES, PULL BOXES, AND ALL DISCONNECT SWITCHES, AND EQUIPMENT CABINETS.
10. ALL NEW MATERIAL SHALL HAVE A U.L. LABEL.
11. PANEL SCHEDULE LOADING AND CIRCUIT ARRANGEMENTS REFLECT POST-CONSTRUCTION EQUIPMENT.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR AS-BUILT PANEL SCHEDULE AND SITE DRAWINGS.
13. ALL TRENCHES IN COMPOUND TO BE HAND DUG.

ELECTRICAL NOTES

24"x36" SCALE: NTS
11"x17" SCALE: NTS

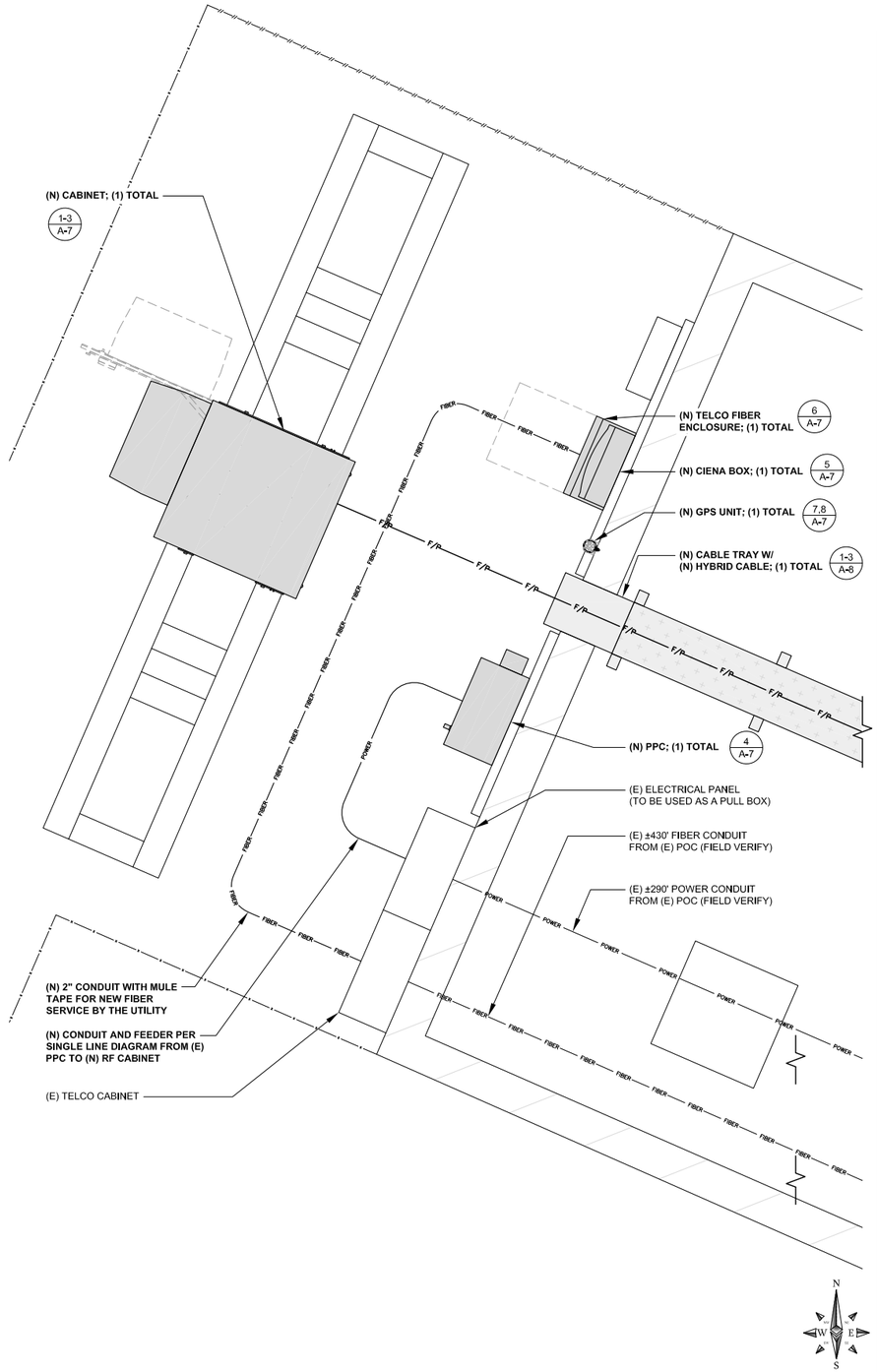
3



ELECTRICAL PLAN

24"x36" SCALE: 1" = 40'-0"
11"x17" SCALE: 1" = 80'-0"
0" 20' 40' 80'

1



ENLARGED ELECTRICAL PLAN

24"x36" SCALE: 3/4" = 1'-0"
11"x17" SCALE: 3/8" = 1'-0"
0" 6" 1' 2'

2

dish wireless.
5701 S SANTA FE DR
LITTLETON, CO 80120

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CHECKED BY:	MM

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SFSFO00398A
724 ARASTRADERO RD
PALO ALTO, CA 94304
ROOFTOP

SHEET TITLE
ELECTRICAL PLAN AND NOTES

SHEET NUMBER
E-1

NOT USED 9

NOT USED 8

NOT USED 7

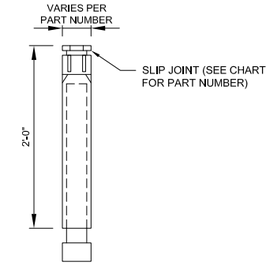
NOT USED 6

NOT USED 5

EXPANSION JOINT DETAIL 4

24"x36" SCALE: NTS
11"x17" SCALE: NTS

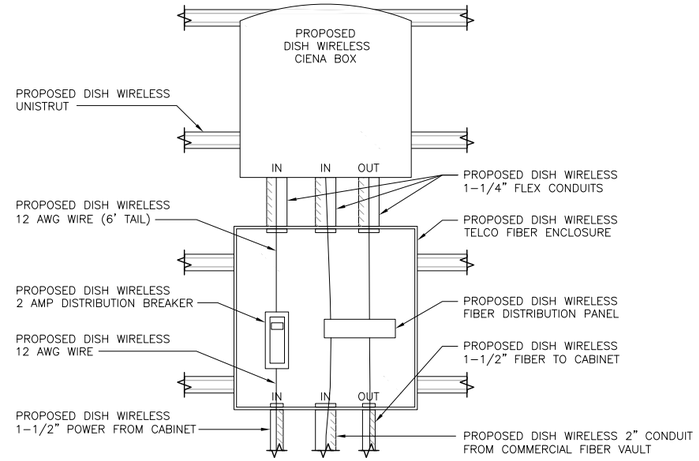
CARLON EXPANSION FITTINGS				
COUPLING END PART#	MALE TERMINAL ADAPTER END PART #	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"
E945M	E945MX	3 1/2"	5	8"
E945N	E945NX	4"	5	8"
E945P	E945PX	5"	1	8"
E945R	E945RX	6"	1	8"



NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

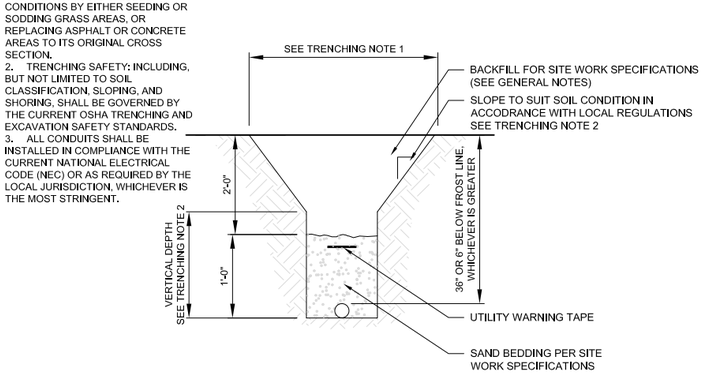
LIT TELCO BOX WIRING LAYOUT 3

24"x36" SCALE: NTS
11"x17" SCALE: NTS



DARK TELCO BOX WIRING LAYOUT 2

24"x36" SCALE: NTS
11"x17" SCALE: NTS



TYP. UNDERGROUND TRENCH DETAIL 1

24"x36" SCALE: NTS
11"x17" SCALE: NTS

TRENCHING NOTES:
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY: INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT OSHA TRENCHING AND EXCAVATION SAFETY STANDARDS.
3. ALL CONDUITS SHALL BE INSTALLED IN COMPLIANCE WITH THE CURRENT NATIONAL ELECTRICAL CODE (NEC) OR AS REQUIRED BY THE LOCAL JURISDICTION, WHICHEVER IS THE MOST STRINGENT.

dish wireless
5701 S SANTA FE DR
LITTLETON, CO 80120

QUALTEK WIRELESS
1200 DEL PASO RD, STE 150
SACRAMENTO, CA 95843

M SQUARED WIRELESS
1387 CALLE AVANZADO
SAN CLEMENTE CA 92673 (949) 391-6824

DRAWN BY: CP

CHECKED BY: MM

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B	02/18/2022	100% CD'S FOR REVIEW
A	02/09/2022	90% CD'S FOR REVIEW

REGISTERED PROFESSIONAL ENGINEER
LOYALL A. WHARTON
C50547
CIVIL
STATE OF CALIFORNIA

DATE SIGNED: 10/03/2022

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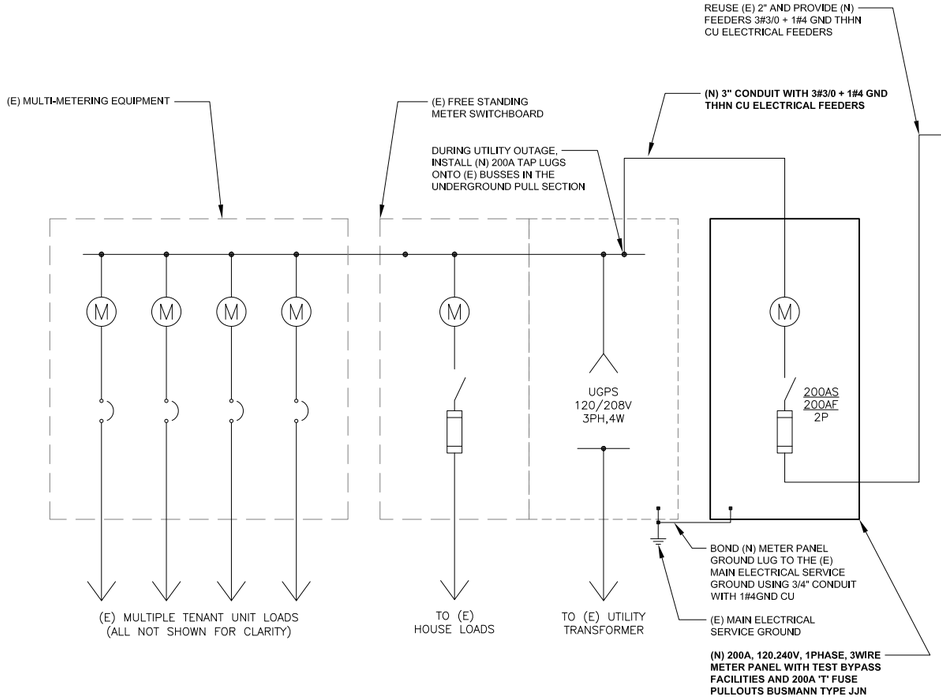
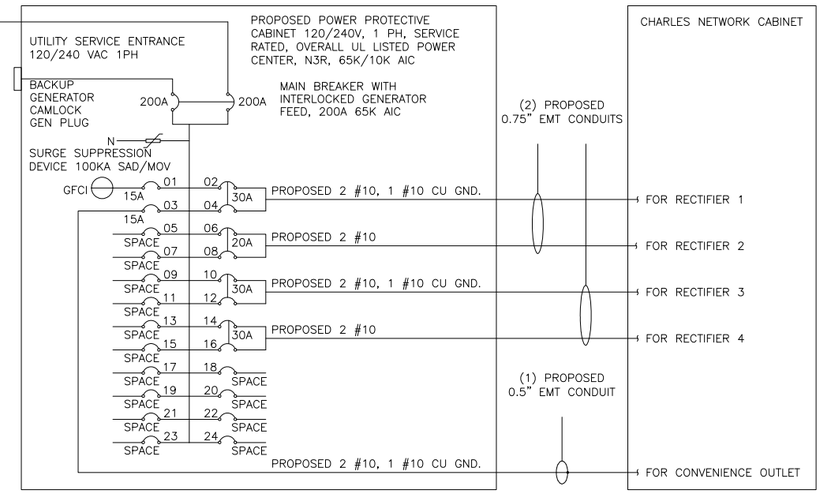
SFSFO00398A
724 ARASTRADERO RD
PALO ALTO, CA 94304
ROOFTOP

SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E-2





NOTE:
BRANCH CIRCUIT WIRING SUPPLYING RECTIFIERS ARE TO BE RATED UL015, 105C, 600V AND PVC INSTALLED, IN THE SIZES SHOWN IN THE ONE-LINE DIAGRAM. CONTRACTOR MAY SUBSTITUTE UL1015 WIRE FOR THWN-2 FOR CONVENIENCE OUTLET BRANCH CIRCUIT.

BREAKERS REQUIRED
(4) 30A, 2P BREAKER – SQUARE D P/N:Q0230
(2) 15A, 1P BREAKER – SQUARE D P/N:Q0115

NOTES

THE ENGINEER OF RECORD HAS PERFORMED ALL REQUIRED SHORT CIRCUIT CALCULATIONS AND THE AIC RATINGS FOR EACH DEVICE IS ADEQUATE TO PROTECT THE EQUIPMENT AND THE ELECTRICAL SYSTEM.

THE ENGINEER OF RECORD HAS PERFORMED ALL REQUIRED VOLTAGE DROP CALCULATIONS AND ALL BRANCH CIRCUIT AND FEEDERS COMPLY WITH THE NEC (LISTED ON T-1) ARTICLE 210.19(A)(1) FPN NO. 4.

THE (2) CONDUITS WITH (4) CURRENT CARRYING CONDUCTORS EACH, SHALL APPLY THE ADJUSTMENT FACTOR OF 80% PER 2014/17 NEC TABLE 310.15(B)(a) OR 2020 NEC TABLE 310.15(C)(1) FOR UL1015 WIRE.

#12 FOR 15A-20A/1P BREAKER: 0.8 x 30A = 24.0A
#10 FOR 25A-30A/2P BREAKER: 0.8 X 40A = 32.0A
#8 FOR 35A-40A/2P BREAKER: 0.8 X 55A = 44.0A
#6 FOR 45A-60A/2P BREAKER: 0.8 X 75A = 60.0A

CONDUIT SIZING: AT 40% FILL PER NEC CHAPTER 9, TABLE A, ARTICLE 358.
0.5" CONDUIT – 0.122 SQ. IN AREA
0.75" CONDUIT – 0.213 SQ. IN AREA
2.0" CONDUIT – 1.316 SQ. IN AREA
3.0" CONDUIT – 2.907 SQ. IN AREA

CABINET CONVENIENCE OUTLET CONDUCTORS (1 CONDUIT): USING THWN-2 CU.

#10 – 0.0211 SQ. IN X 2 = 0.0422 SQ. IN
#10 – 0.0211 SQ. IN X 1 = 0.0211 SQ. IN <GROUND
TOTAL = 0.0633 SQ. IN

0.5" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (3) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

RECTIFIER CONDUCTORS (1 CONDUIT): USING UL1015, CU.

#10 – 0.0266 SQ. IN X 4 = 0.1064 SQ. IN
#10 – 0.0082 SQ. IN X 1 = 0.0082 SQ. IN <BARE GROUND
TOTAL = 0.1146 SQ. IN

0.75" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (5) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

PPC FEED CONDUCTORS (1 CONDUIT): USING THWN, CU.

3/0 – 0.2679 SQ. IN X 3 = 0.8037 SQ. IN
#6 – 0.0507 SQ. IN X 1 = 0.0507 SQ. IN <GROUND
TOTAL = 0.8544 SQ. IN

3.0" SCH 40 PVC CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (4) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

PROPOSED CHARLES PANEL SCHEDULE

LOAD SERVED	VOLT AMPS (WATTS) L1	VOLT AMPS (WATTS) L2	TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPS (WATTS) L1	VOLT AMPS (WATTS) L2	LOAD SERVED
PPC GFCI OUTLET	180		15A	1	A	2	30A	2880		ABB/GE INFINITY
CHARLES GFCI OUTLET		180	15A	3	B	4			2880	RECTIFIER 1
-SPACE-				5	A	6	30A	2880		ABB/GE INFINITY
-SPACE-				7	B	9			2880	RECTIFIER 2
-SPACE-				9	A	11	30A	2880		ABB/GE INFINITY
-SPACE-				11	B	13			2880	RECTIFIER 3
-SPACE-				13	A	15	30A	2880		ABB/GE INFINITY
-SPACE-				15	B	17			2880	RECTIFIER 4
-SPACE-				17	A	19				-SPACE-
-SPACE-				19	B	21				-SPACE-
-SPACE-				21	A	23				-SPACE-
-SPACE-				23	B	25				-SPACE-
VOLTAGE AMPS	180	180						11520	11520	

200A MCB, 1ø, 24 SPACE, 120/240V MB RATING: 65,000 AIC	L1	L2	
	11700	11700	VOLTAGE AMPS
	98	98	AMPS
	98		MAX AMPS
	121.9		MAX 125%

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5701 S SANTA FE DR
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1387 CALLE AVANZADO
SAN CLEMENTE CA 92673 (949) 391-6824

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DATE SIGNED: 10/03/2022

Loyall A. Wharton, P.E.
Professional Engineer License: #C50547
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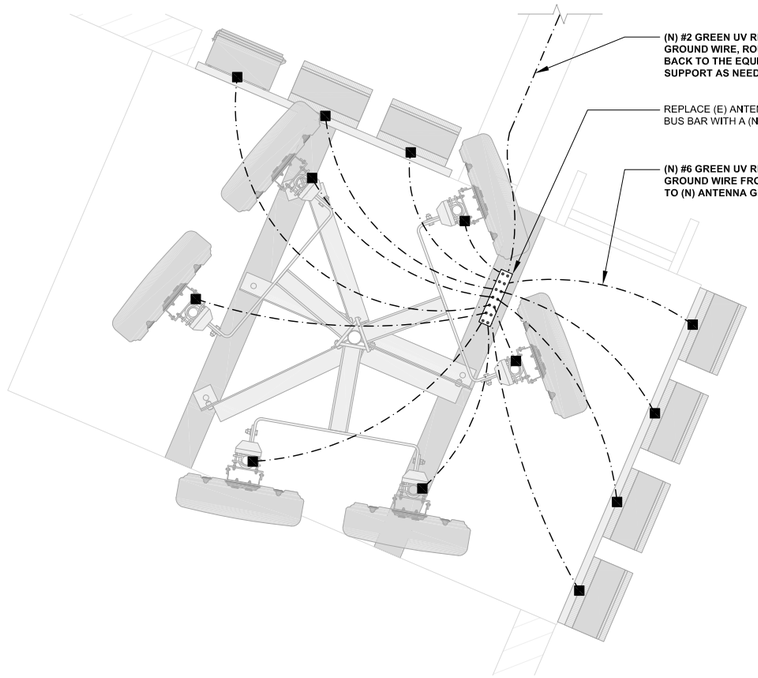
SFSFO00398A
724 ARASTRADERO RD
PALO ALTO, CA 94304
ROOFTOP

SHEET TITLE
ELECTRICAL ONE-LINE & PANEL SCHEDULE

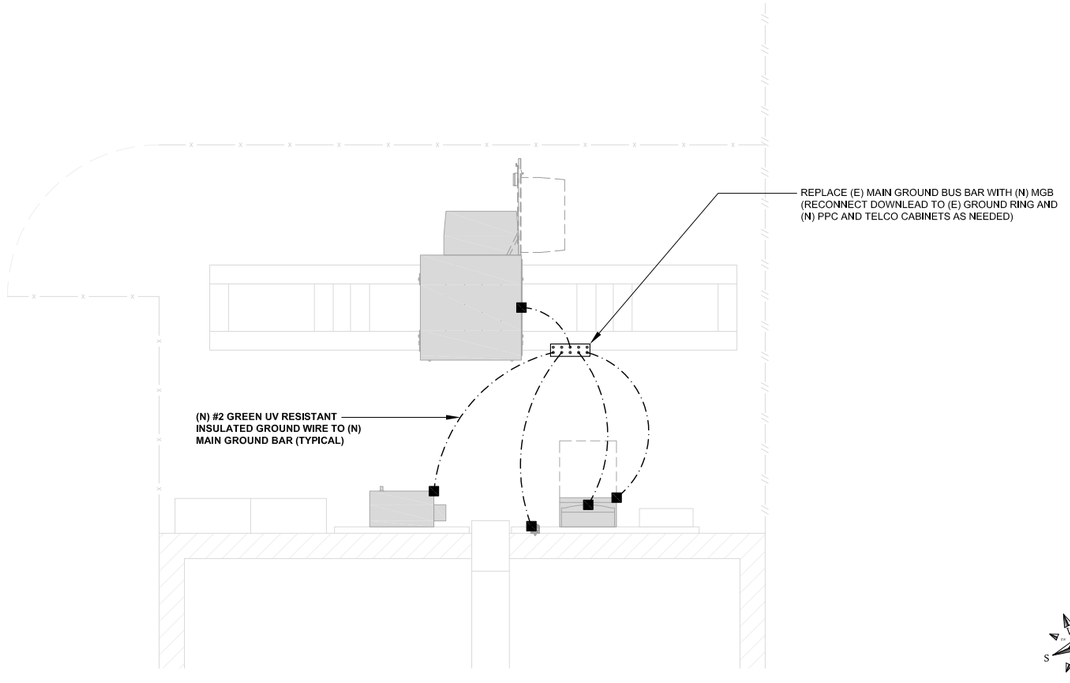
SHEET NUMBER
E-3



ANTENNA GROUNDING PLAN

24"x36" SCALE: 3/4" = 1'-0"
11"x17" SCALE: 3/8" = 1'-0"
0" 6" 1' 2'

3



EQUIPMENT GROUNDING PLAN

24"x36" SCALE: 1/2" = 1'-0"
11"x17" SCALE: 1/4" = 1'-0"
0" 1' 2' 4'

2

EXOTHERMIC CONNECTION
MECHANICAL CONNECTION
GROUND BUS BAR
GROUND ROD
TEST GROUND ROD WITH INSPECTION SLEEVE
#2 AWG STRANDED & INSULATED
#2 AWG SOLID COPPER TINNED

GROUNDING LEGEND

1. GROUNDING IS SHOWN DIAGRAMMATICALLY ONLY.
2. CONTRACTOR SHALL GROUND ALL EQUIPMENT AS A COMPLETE SYSTEM. GROUNDING SHALL BE IN COMPLIANCE WITH NEC SECTION 250 AND DISH WIRELESS GROUNDING AND BONDING REQUIREMENTS AND MANUFACTURER'S SPECIFICATIONS.
3. ALL GROUND CONDUCTORS SHALL BE COPPER; NO ALUMINUM CONDUCTORS SHALL BE USED.
4. NO EXOTHERMIC WELDING ON ROOFTOP

GROUNDING ROOFTOP KEY NOTES

(A) EXTERIOR GROUND RING: #2 AWG SOLID COPPER, BURIED AT A DEPTH OF AT LEAST 30 INCHES BELOW GRADE, OR 6 INCHES BELOW THE FROST LINE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL OR FOOTING.

(B) TOWER GROUND RING: THE GROUND RING SYSTEM SHALL BE INSTALLED AROUND AN ANTENNA TOWER'S LEGS, AND/OR GUY ANCHORS. WHERE SEPARATE SYSTEMS HAVE BEEN PROVIDED FOR THE TOWER AND THE BUILDING, AT LEAST TWO BONDS SHALL BE MADE BETWEEN THE TOWER RING GROUND SYSTEM AND THE BUILDING RING GROUND SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS.

(C) INTERIOR GROUND RING: #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTOR EXTENDED AROUND THE PERIMETER OF THE EQUIPMENT AREA. ALL NON-TELECOMMUNICATIONS RELATED METALLIC OBJECTS FOUND WITHIN A SITE SHALL BE GROUNDED TO THE INTERIOR GROUND RING WITH #6 AWG STRANDED GREEN INSULATED CONDUCTOR.

(D) BOND TO INTERIOR GROUND RING: #2 AWG SOLID TINNED COPPER WIRE PRIMARY BONDS SHALL BE PROVIDED AT LEAST AT FOUR POINTS ON THE INTERIOR GROUND RING, LOCATED AT THE CORNERS OF THE BUILDING.

(E) GROUND ROD: UL LISTED COPPER CLAD STEEL. MINIMUM 1/2" DIAMETER BY EIGHT FEET LONG. GROUND RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES. GROUND RODS SHALL BE DRIVEN TO THE DEPTH OF GROUND RING CONDUCTOR.

(F) CELL REFERENCE GROUND BAR: POINT OF GROUND REFERENCE FOR ALL COMMUNICATIONS EQUIPMENT FRAMES. ALL BONDS ARE MADE WITH #2 AWG UNLESS NOTED OTHERWISE STRANDED GREEN INSULATED COPPER CONDUCTORS. BOND TO GROUND RING WITH (2) #2 SOLID TINNED COPPER CONDUCTORS.

(G) HATCH PLATE GROUND BAR: BOND TO THE INTERIOR GROUND RING WITH TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS. WHEN A HATCH-PLATE AND A CELL REFERENCE GROUND BAR ARE BOTH PRESENT, THE CRGB MUST BE CONNECTED TO THE HATCH-PLATE AND TO THE INTERIOR GROUND RING USING (2) TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS EACH.

(H) EXTERIOR CABLE ENTRY PORT GROUND BARS: LOCATED AT THE ENTRANCE TO THE CELL SITE BUILDING. BOND TO GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTORS WITH AN EXOTHERMIC WELD AND INSPECTION SLEEVE.

(J) TELCO GROUND BAR: BOND TO BOTH CELL REFERENCE GROUND BAR AND EXTERIOR GROUND RING.

(K) FRAME BONDING: THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUS THAT IS NOT ISOLATED FROM THE EQUIPMENTS METAL FRAMEWORK. BOND THE FRAME GROUND TO THE "I" SECTION OF THE CELL REFERENCE GROUND BAR OR SUPPLEMENTARY CONDUCTOR. (SHEET G3 DETAIL1)

(L) INTERIOR UNIT BONDS: METAL FRAMES, CABINETS AND INDIVIDUAL METALLIC UNITS LOCATED WITH THE AREA OF THE INTERIOR GROUND RING REQUIRE A #6 AWG STRANDED GREEN INSULATED COPPER BOND TO THE INTERIOR GROUND RING.

(M) FENCE AND GATE GROUNDING: METAL FENCES WITHIN 7 FEET OF THE EXTERIOR GROUND RING OR OBJECTS BONDED TO THE EXTERIOR GROUND RING SHALL BE BONDED TO THE GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTOR AT AN INTERVAL NOT EXCEEDING 25 FEET. BONDS SHALL BE MADE AT EACH GATE POST AND ACROSS GATE OPENINGS.

(N) EXTERIOR UNIT BONDS: METALLIC OBJECTS, EXTERNAL TO OR MOUNTED TO THE BUILDING, SHALL BE BONDED TO THE EXTERIOR GROUND RING. USING #2 TINNED SOLID COPPER WIRE

(P) ICE BRIDGE SUPPORTS: EACH ICE BRIDGE LEG SHALL BE BONDED TO THE GROUND RING WITH #2 AWG BARE TINNED COPPER CONDUCTOR. PROVIDE EXOTHERMIC WELDS AT BOTH THE ICE BRIDGE LEG AND BURIED GROUND RING.

(Q) DURING ALL DC POWER SYSTEM CHANGES INCLUDING DC SYSTEM CHANGE OUTS, RECTIFIER REPLACEMENTS OR ADDITIONS, BREAKER DISTRIBUTION CHANGES, BATTERY ADDITIONS, BATTERY REPLACEMENTS AND INSTALLATIONS OR CHANGES TO DC CONVERTER SYSTEMS IT SHALL BE REQUIRED THAT SERVICE CONTRACTORS VERIFY ALL DC POWER SYSTEMS ARE EQUIPPED WITH A MASTER DC SYSTEM RETURN GROUND CONDUCTOR FROM THE DC POWER SYSTEM COMMON RETURN BUS DIRECTLY CONNECTED TO THE CELL SITE REFERENCE GROUND BAR

(R) TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO PROPOSED ANTENNA MOUNT.

REFER TO DISH WIRELESS GROUNDING NOTES.

GROUNDING KEY NOTES

1

dish wireless.
5701 S SANTA FE DR
LITTLETON, CO 80120

QUALTEK WIRELESS
1200 DEL PASO RD, STE 150
SACRAMENTO, CA 95843

M SQUARED WIRELESS
1387 CALLE AVANZADO
SAN CLEMENTE CA 92673 (949) 391-6824

DRAWN BY:	CP
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SFSFO00398A
724 ARASTRADERO RD
PALO ALTO, CA 94304
ROOFTOP

SHEET TITLE
GROUNDING PLANS AND NOTES

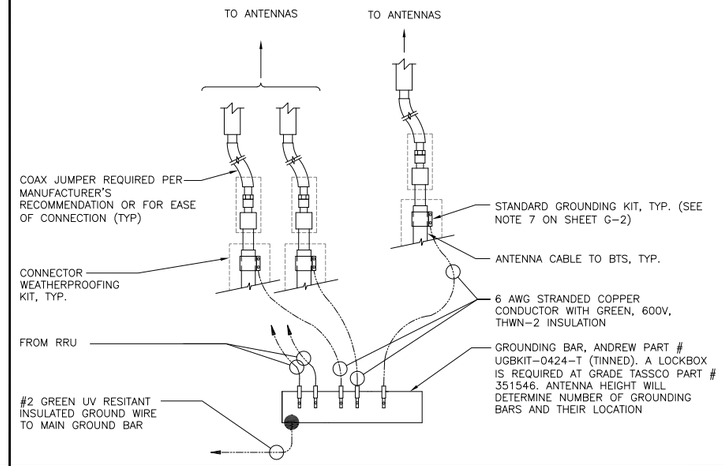
SHEET NUMBER
G-1

1. EXOTHERMIC WELD (2) TWO, #2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUND BAR. ROUTE CONDUCTORS TO BURIED GROUND RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
2. ALL EXTERIOR GROUNDING HARDWARE SHALL BE STAINLESS STEEL 3/8" DIAMETER OR LARGER. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
3. FOR GROUND BOND TO STEEL ONLY: COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
4. DO NOT INSTALL CABLE GROUNDING KIT AT A BEND AND ALWAYS DIRECT GROUND CONDUCTOR DOWN TO GROUNDING BUS.
5. NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUND BAR AND BOLTED ON THE BACK SIDE.
6. ALL GROUNDING PARTS AND EQUIPMENT TO BE SUPPLIED AND INSTALLED BY CONTRACTOR.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL GROUND BAR AS REQUIRED.
8. ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).

TYPICAL GROUNDING NOTES

24"x36" SCALE: NTS
11"x17" SCALE: NTS

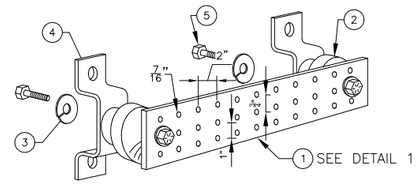
9



GROUNDING BAR CONNECTION

24"x36" SCALE: NTS
11"x17" SCALE: NTS

6



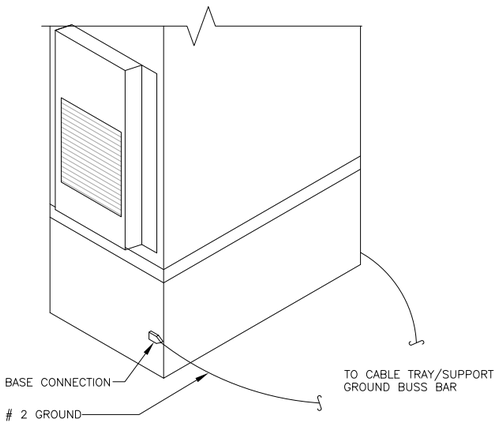
LEGEND:

1. COPPER GROUND BAR, 1/4"X 4"X 20", NEWTON INSTRUMENT CO. CAT. NO. B-6142 OR EQUAL. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION. (ACTUAL GROUND BAR SIZE WILL VARY BASED ON NUMBER OF GROUND CONNECTIONS)
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4 OR EQUAL
3. 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8 OR EQUAL WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056 OR EQUAL
4. 5/8-11 X 1" HHCS BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1 OR EQUAL
5. INSULATORS SHALL BE ELIMINATED WHEN BONDING DIRECTLY TO TOWER/MONOPOLE STRUCTURE. CONNECTION TO TOWER/MONOPOLE STRUCTURE SHALL BE PER MANUFACTURERS RECOMMENDATIONS

GROUNDING BAR DETAIL

24"x36" SCALE: NTS
11"x17" SCALE: NTS

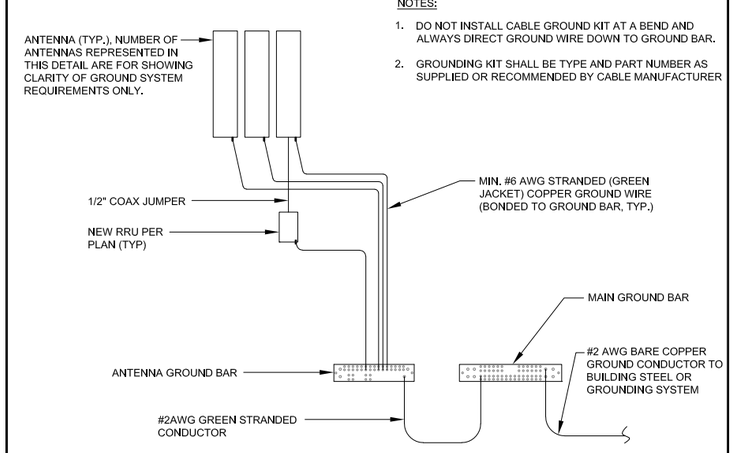
3



OUTDOOR CABINET GROUNDING

24"x36" SCALE: NTS
11"x17" SCALE: NTS

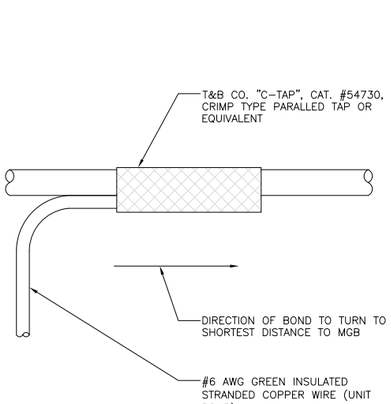
8



ANTENNA GROUNDING PLAN

24"x36" SCALE: NTS
11"x17" SCALE: NTS

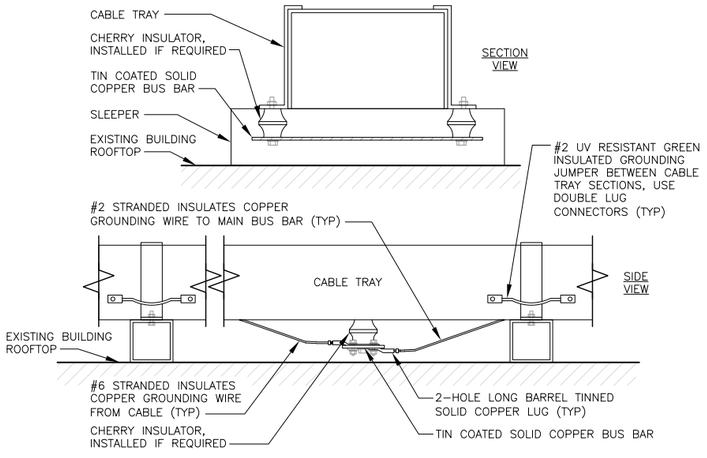
5



GROUNDING WIRE CONNECTION

24"x36" SCALE: NTS
11"x17" SCALE: NTS

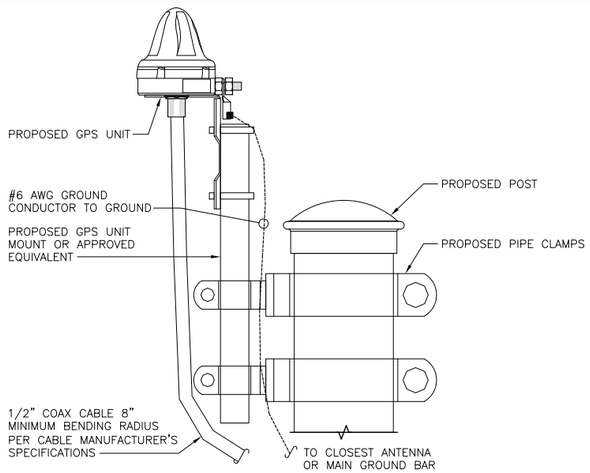
2



CABLE TRAY GROUND BUSS BAR

24"x36" SCALE: NTS
11"x17" SCALE: NTS

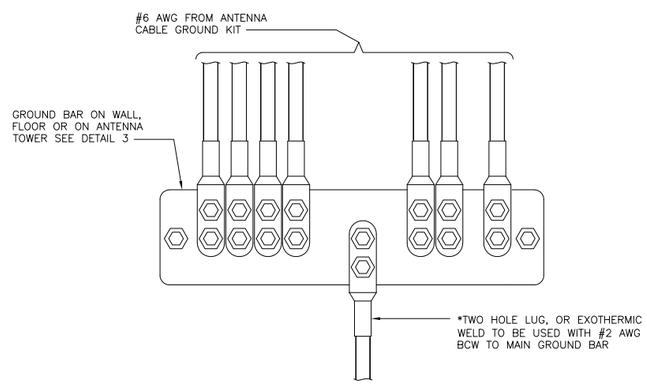
7



GPS UNIT GROUNDING

24"x36" SCALE: NTS
11"x17" SCALE: NTS

4



* GROUND BARS AT THE BOTTOM OF TOWERS/MONOPOLES SHALL ONLY USE EXOTHERMIC WELDS.

WIRE TO GROUND BAR CONNECTION

24"x36" SCALE: NTS
11"x17" SCALE: NTS

1

dish wireless.
5701 S SANTA FE DR
LITTLETON, CO 80120

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1200 DEL PASO RD, STE 150
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M SQUARED WIRELESS
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DRAWN BY: CP
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SFSFO00398A
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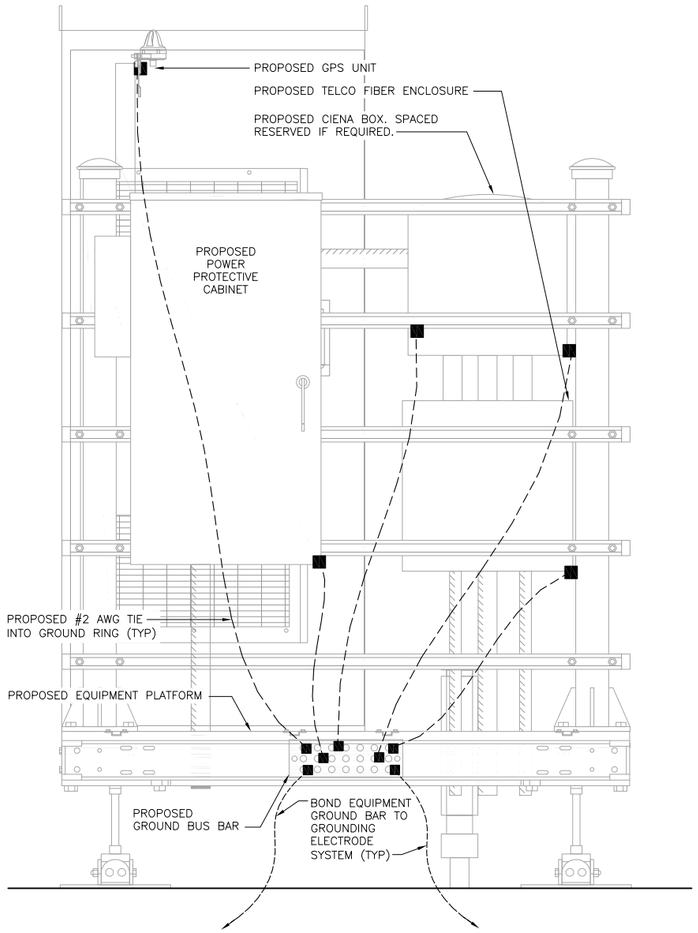
ROOFTOP

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-2



NOTE:

1. SHOWN ONLY FOR DETAILING GROUNDING DOWNLEADS.

GROUNDING AT EQUIPMENT CABINETS

24"x36" SCALE: NTS
11"x17" SCALE: NTS

7

NOT USED

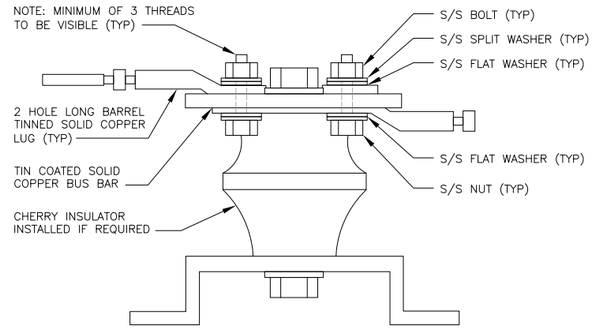
6

NOT USED

5

NOT USED

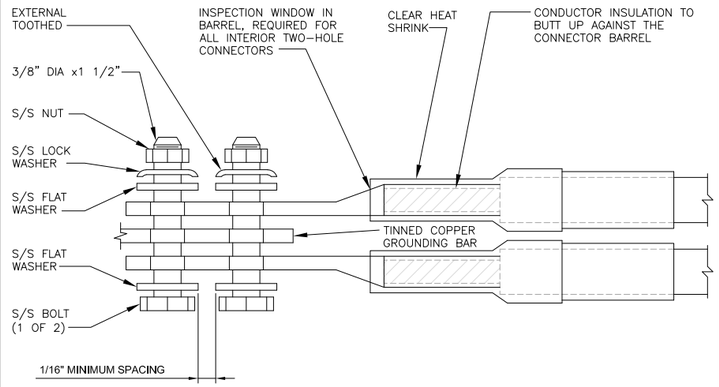
4



LUG DETAIL

24"x36" SCALE: NTS
11"x17" SCALE: NTS

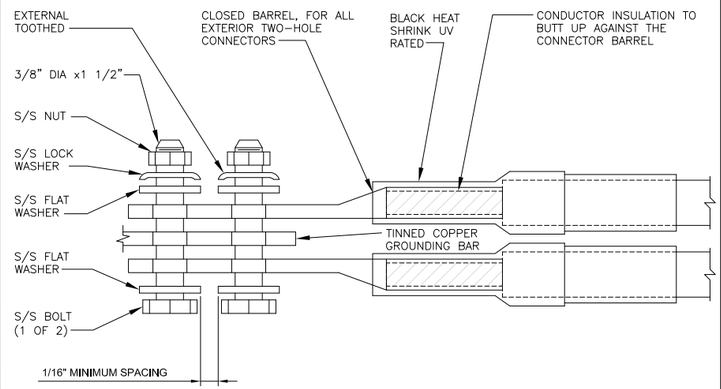
3



INTERIOR TWO HOLE LUG

24"x36" SCALE: NTS
11"x17" SCALE: NTS

2



EXTERIOR TWO HOLE LUG

24"x36" SCALE: NTS
11"x17" SCALE: NTS

1

dish wireless.
5701 S SANTA FE DR
LITTLETON, CO 80120

QUALTEK WIRELESS
1200 DEL PASO RD, STE 150
SACRAMENTO, CA 95843

M SQUARED WIRELESS
1387 CALLE AVANZADO
SAN CLEMENTE CA 92673 (949) 391-6824

DRAWN BY: CP

CHECKED BY: MM

REV	DATE	DESCRIPTION
2	10/03/2022	100% CD'S FOR SUBMITTAL
1	09/23/2022	100% CD'S FOR SUBMITTAL
0	03/24/2022	100% CD'S FOR SUBMITTAL
B	02/18/2022	100% CD'S FOR REVIEW
A	02/09/2022	90% CD'S FOR REVIEW

REGISTERED PROFESSIONAL ENGINEER
LOYALL A. WHARTON
C50547
CIVIL
STATE OF CALIFORNIA

DATE SIGNED: 10/03/2022

Loyall A. Wharton, P.E.
Professional Engineer License: #C50547
Expiration Date: 06-30-2023

SFSFO00398A
724 ARASTRADERO RD
PALO ALTO, CA 94304
ROOFTOP

SHEET TITLE

GROUNDING DETAILS

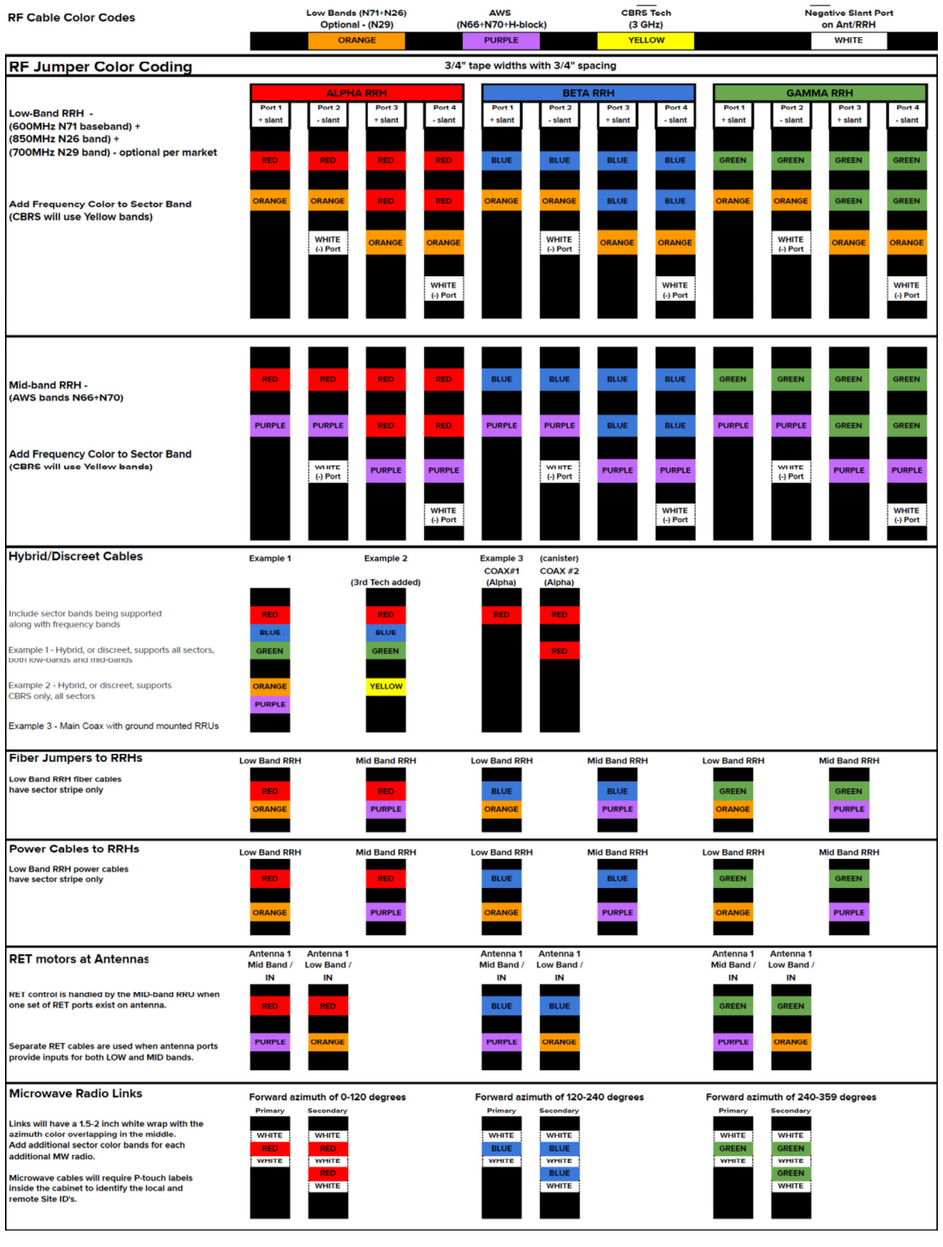
SHEET NUMBER

G-3

NOTE:

1. REFER TO LATEST COLOR CODE BEFORE CONSTRUCTION START.

RF COLOR CODING



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C50547
CIVIL
STATE OF CALIFORNIA

DATE SIGNED: 10/03/2022

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Professional Engineer License: #C50547
Expiration Date: 06-30-2023

SFSFO00398A
724 ARASTRADERO RD
PALO ALTO, CA 94304
ROOFTOP

SHEET TITLE

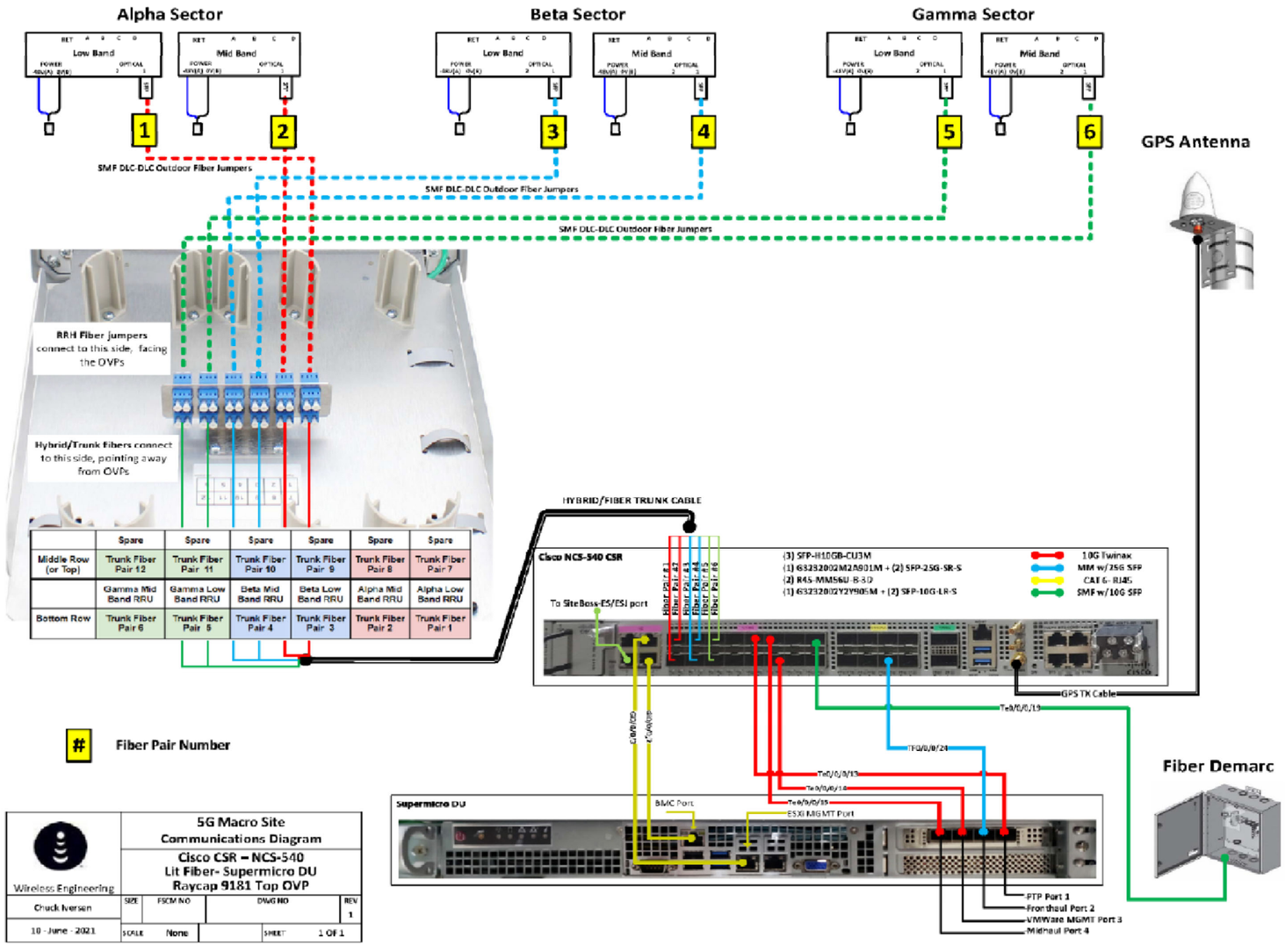
RF CABLE COLOR CODE

SHEET NUMBER

RF-1

NOTE:

1. REFER TO LATEST PLUMBING BEFORE CONSTRUCTION START.



	Spare	Spare	Spare	Spare	Spare	Spare
Middle Row (or Top)	Trunk Fiber Pair 12	Trunk Fiber Pair 11	Trunk Fiber Pair 10	Trunk Fiber Pair 9	Trunk Fiber Pair 8	Trunk Fiber Pair 7
	Gamma Mid Band RRU	Gamma Low Band RRU	Beta Mid Band RRU	Beta Low Band RRU	Alpha Mid Band RRU	Alpha Low Band RRU
Bottom Row	Trunk Fiber Pair 6	Trunk Fiber Pair 5	Trunk Fiber Pair 4	Trunk Fiber Pair 3	Trunk Fiber Pair 2	Trunk Fiber Pair 1

Wireless Engineering	5G Macro Site Communications Diagram Cisco CSR – NCS-540 Lit Fiber- Supermicro DU Raycap 9181 Top OVP		
Chuck Iversen	SIZE	FSCM NO	DWG NO / REV 1
10 - June - 2021	SCALE None		SHEET 1 OF 1

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REGISTERED PROFESSIONAL ENGINEER LOYALL A. WHARTON C50547 CIVIL STATE OF CALIFORNIA

DATE SIGNED: 10/03/2022

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Professional Engineer License: #C50547
Expiration Date: 06-30-2023

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ROOFTOP

SHEET TITLE

PLUMBING DIAGRAM

SHEET NUMBER

RF-2

EXOTHERMIC CONNECTION

MECHANICAL CONNECTION

CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE

SINGLE POLE SWITCH

DUPLEX RECEPTACLE

DUPLEX GFCI RECEPTACLE

FLUORESCENT LIGHTING FIXTURE
(2) TWO LAMPS 48-T8

SMOKE DETECTION (DC)

EMERGENCY LIGHTING (DC)

SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW
LED-1-25A400/51K-SR4-120-PE-DDBTXD

CHAIN LINK FENCE

WOOD/WROUGHT IRON FENCE

WALL STRUCTURE

LEASE AREA

PROPERTY LINE (PL)

SETBACKS

ICE BRIDGE

CABLE TRAY

WATER LINE

UNDERGROUND POWER

UNDERGROUND TELCO

OVERHEAD POWER

OVERHEAD TELCO

UNDERGROUND TELCO/POWER

ABOVE GROUND POWER

ABOVE GROUND TELCO

ABOVE GROUND TELCO/POWER

WORKPOINT

SECTION REFERENCE

DETAIL REFERENCE

LEGEND

AB	ANCHOR BOLT
ABV	ABOVE
AC	ALTERNATING CURRENT
ADDL	ADDITIONAL
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AGL	ABOVE GROUND LEVEL
AIC	AMPERAGE INTERRUPTION CAPACITY
ALUM	ALUMINUM
ALT	ALTERNATE
ANT	ANTENNA
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BLDG	BUILDING
BLK	BLOCK
BLKG	BLOCKING
BM	BEAM
BTC	BARE TINNED COPPER CONDUCTOR
BOF	BOTTOM OF FOOTING
CAB	CABINET
CANT	CANTILEVERED
CHG	CHARGING
CLG	CEILING
CLR	CLEAR
COL	COLUMN
COMM	COMMON
CONC	CONCRETE
CONSTR	CONSTRUCTION
DBL	DOUBLE
DC	DIRECT CURRENT
DEPT	DEPARTMENT
DF	DOUGLAS FIR
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DWG	DRAWING
DWL	DOWEL
EA	EACH
EC	ELECTRICAL CONDUCTOR
EL.	ELEVATION
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
ENG	ENGINEER
EQ	EQUAL
EXP	EXPANSION
EXT	EXTERIOR
EW	EACH WAY
FAB	FABRICATION
FF	FINISH FLOOR
FG	FINISH GRADE
FIF	FACILITY INTERFACE FRAME
FIN	FINISH(ED)
FLR	FLOOR
FDN	FOUNDATION
FOC	FACE OF CONCRETE
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FOW	FACE OF WALL
FS	FINISH SURFACE
FT	FOOT
FTG	FOOTING
GA	GAUGE
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GLB	GLUE LAMINATED BEAM
GLV	GALVANIZED
GPS	GLOBAL POSITIONING SYSTEM
GND	GROUND
GSM	GLOBAL SYSTEM FOR MOBILE
HDG	HOT DIPPED GALVANIZED
HDR	HEADER
HGR	HANGER
HVAC	HEAT/VENTILATION/AIR CONDITIONING
HT	HEIGHT
IGR	INTERIOR GROUND RING
IN	INCH
INT	INTERIOR
LB(S)	POUND(S)
LF	LINEAR FEET
LTE	LONG TERM EVOLUTION
MAS	MASONRY
MAX	MAXIMUM
MB	MACHINE BOLT
MECH	MECHANICAL
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MISC	MISCELLANEOUS
MTL	METAL
MTS	MANUAL TRANSFER SWITCH
MW	MICROWAVE
NEC	NATIONAL ELECTRIC CODE
NM	NEWTON METERS
NO.	NUMBER
#	NUMBER
NTS	NOT TO SCALE
OC	ON-CENTER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OPNG	OPENING
P/C	PRECAST CONCRETE
PCS	PERSONAL COMMUNICATION SERVICES
PCU	PRIMARY CONTROL UNIT
PRC	PRIMARY RADIO CABINET
PP	POLARIZING PRESERVING
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TREATED
PWR	POWER CABINET
QTY	QUANTITY
RAD	RADIUS
RECT	RECTIFIER
REF	REFERENCE
REINF	REINFORCEMENT
REQ'D	REQUIRED
RET	REMOTE ELECTRIC TILT
RF	RADIO FREQUENCY
RMC	RIGID METALLIC CONDUIT
RRH	REMOTE RADIO HEAD
RRU	REMOTE RADIO UNIT
RWY	RACEWAY
SCH	SCHEDULE
SHT	SHEET
SIAD	SMART INTEGRATED ACCESS DEVICE
SIM	SIMILAR
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
STD	STANDARD
STL	STEEL
TEMP	TEMPORARY
THK	THICKNESS
TMA	TOWER MOUNTED AMPLIFIER
TN	TOE NAIL
TOA	TOP OF ANTENNA
TOC	TOP OF CURB
TOF	TOP OF FOUNDATION
TOP	TOP OF PLATE (PARAPET)
TOS	TOP OF STEEL
TOW	TOP OF WALL
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE
UMTS	UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
UPS	UNITERRUPTIBLE POWER SYSTEM (DC POWER PLANT)
VIF	VERIFIED IN FIELD
W	WIDE
W/	WITH
WD	WOOD
WP	WEATHERPROOF
WT	WEIGHT

ABBREVIATIONS

dish wireless.
5701 S SANTA FE DR
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ROOFTOP

SHEET TITLE

LEGEND AND ABBREVIATIONS

SHEET NUMBER

GN-1

SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED - NO WORK SHALL COMMENCE PRIOR TO CONTRACTOR RECEIVING A WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE DISH WIRELESS AND TOWER OWNER NOC & THE DISH WIRELESS AND TOWER OWNER CONSTRUCTION MANAGER.

2. "LOOK UP" - DISH WIRELESS AND TOWER OWNER SAFETY CLIMB REQUIREMENT:

THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR DISH WIRELESS AND DISH WIRELESS AND TOWER OWNER POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.

3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.

4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND DISH WIRELESS AND TOWER OWNER STANDARDS, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA-322 (LATEST EDITION).

5. ALL SITE WORK TO COMPLY WITH DISH WIRELESS AND TOWER OWNER INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON DISH WIRELESS AND TOWER OWNER TOWER SITE AND LATEST VERSION OF ANSI/TIA-1019-A-2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."

6. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY DISH WIRELESS AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.

7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

9. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES INCLUDING PRIVATE LOCATES SERVICES PRIOR TO THE START OF CONSTRUCTION.

10. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E) CONSTRUCTION SAFETY PROCEDURES.

11. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND DISH PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.

12. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.

13. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF DISH WIRELESS AND TOWER OWNER, AND/OR LOCAL UTILITIES.

14. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.

15. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.

16. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.

17. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.

18. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

19. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

20. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS AND RADIOS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

21. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

22. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

GENERAL NOTES:

1.FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION

CARRIER:DISH WIRELESS

TOWER OWNER:TOWER OWNER

2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.

3. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.

4. NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.

5. SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.

6. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CARRIER POC AND TOWER OWNER.

7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

8. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

9. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

10. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.

11. CONTRACTOR IS TO PERFORM A SITE INVESTIGATION, BEFORE SUBMITTING BIDS, TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.

12. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF DISH WIRELESS AND TOWER OWNER

13. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

14. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

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M SQUARED WIRELESS
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SAN CLEMENTE CA 92673 (949) 391-6824

DRAWN BY:	CP
CHECKED BY:	MM

REV	DATE	DESCRIPTION
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1	09/23/2022	100% CD'S FOR SUBMITTAL
0	03/24/2022	100% CD'S FOR SUBMITTAL
B	02/18/2022	100% CD'S FOR REVIEW
A	02/09/2022	90% CD'S FOR REVIEW

REGISTERED PROFESSIONAL ENGINEER
LOYALL A. WHARTON
C50547
CIVIL
STATE OF CALIFORNIA

DATE SIGNED: 10/03/2022

Loyall A. Wharton, P.E.
Professional Engineer License: #C50547
Expiration Date: 06-30-2023

SFSFO00398A
724 ARASTRADERO RD
PALO ALTO, CA 94304
ROOFTOP

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-2

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
2. UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
3. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°f AT TIME OF PLACEMENT.
4. CONCRETE EXPOSED TO FREEZE-THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER-TO-CEMENT RATIO (W/C) OF 0.45.
5. ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:

#4 BARS AND SMALLER 40 ksi

#5 BARS AND LARGER 60 ksi

6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
   - CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3"
   - CONCRETE EXPOSED TO EARTH OR WEATHER:
   - #6 BARS AND LARGER 2"
   - #5 BARS AND SMALLER 1-1/2"
   - CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
   - SLAB AND WALLS 3/4"
   - BEAMS AND COLUMNS 1-1/2"
7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.

4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.

4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.

5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
8. TIE WRAPS ARE NOT ALLOWED.
9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER-ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3 (OR BETTER) FOR EXTERIOR LOCATIONS.
25. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR DISH WIRELESS AND TOWER OWNER BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "DISH WIRELESS".
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

dish wireless.
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GROUNDING NOTES:

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
3. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.
4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.
7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
15. APPROVED ANTIOXIDANT COATINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
17. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
18. BOND ALL METALLIC OBJECTS WITHIN 6 ft OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.
19. GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (i.e., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON-METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).
21. BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY). DO NOT ATTACH GROUNDING TO FIRE SPRINKLER SYSTEM PIPES.

dish wireless.
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